IDG.net

KEEPING SECRETS

Your customers' privacy is serious business.

PAGE 62 Can a chief privacy officer keep you out of trouble?

PAGE 68 Three privacy traps and how to avoid them.

PAGE 50 A North Sea "data haven" promises to keep your secrets, even if it has to defy governments and deep-six your servers to do it.

TIME FOR LINUX?

What it will take to make Linux a player inside the corporate data center. Page 108

COMPUTERWORLD

THE NEWSPAPER FOR IT LEADERS • WWW.COMPUTERWORLD.COM

NOVEMBER 13, 2000 • VOL. 34 • NO. 46 • $5 COPY

VOTER SYSTEM IN DISARRAY ACROSS U.S.

Decentralized, disparate databases leave door open to multiple registrations, fraud

BY CAROL SLIWA, LEE COPELAND AND DON TENNANT

Dead voters in Florida?

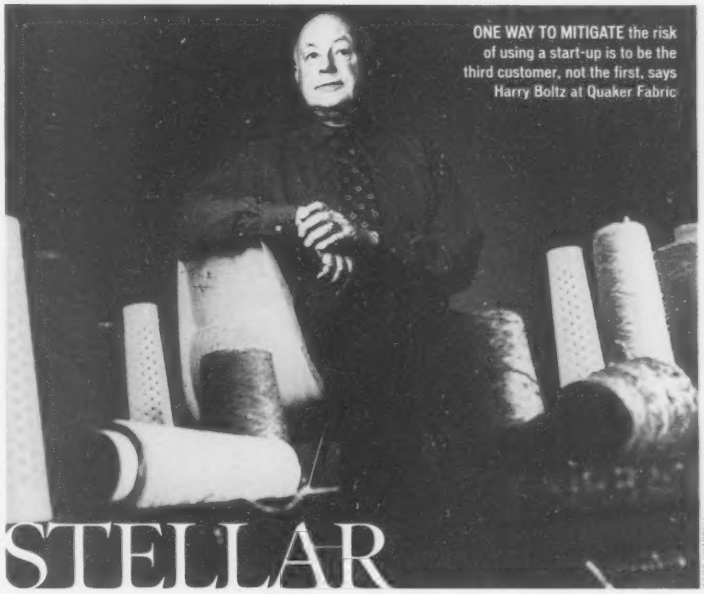
Scores of Democratic and Republican party officials are hunting for any shred of evidence that fraudulent activity might have swayed the razor-thin margin separating the country's two top candidates for president.

ELECTION2000

In this day and age, officials might have hoped that technology could prevent dead, multiply registered or any other ineligible voters from casting a ballot. And they might have expected that frequently updated information technology systems would ensure that properly registered voters could find their names on the rolls when they arrived to vote.

Instead, political observers will find that voters are registered and tracked by a patchwork quilt of technology systems that can vary as wildly as the weather in different parts of the country. Not only will they find no movement afoot to create a national voter registry, but they will also see states struggling to establish and update their own central-

Voter System, page 6



ONE WAY TO MITIGATE the risk of using a start-up is to be the third customer, not the first, says Harry Boltz at Quaker Fabric

WEBB CHAPPELL

STELLAR START-UPS

Hooking up with a young company — with its skimpy track record and software that's still being debugged — is certainly a gamble. It requires extra vigilance to manage the risk, but users say the payoff can be tremendous: access to advanced technology that provides a competitive advantage. Which start-ups are likely to really pay off? Check out *Computerworld*'s Top 100 Emerging Companies to Watch in 2001.

EMERGING COMPANIES 2001 100 COMPANIES TO WATCH

Supplement begins after page 72.

SYSTEM MENDED, HMO OUTSOURCES

Oxford spent two years fixing botched project

BY KIM S. NASH

Oxford Health Plans Inc., which suffered multimillion-dollar losses in 1997 and 1998 after a botched systems upgrade, plans to outsource most of its information technology operations, starting next year, according to sources inside and close to the company.

The decision to hire Computer Sciences Corp. in a five-year deal — estimated at $270 million to $330 million — came after seven months of evaluation of proposals from CSC, Entex Consulting Services and IBM, the sources said.

A spokeswoman for the Trumbull, Conn.-based health maintenance organization confirmed plans to outsource its help desk and desktop support; that announcement is due

Oxford, page 16

U.S. MAY FACE NET-BASED HOLY WAR

Experts say sites are woefully unprepared

BY DAN VERTON

As hacker groups in the Middle East threaten to launch a "cyber-Jihad," or electronic holy war, against companies with ties to Israel, security experts said Internet security at most U.S. companies remains woefully inadequate to defend against such attacks.

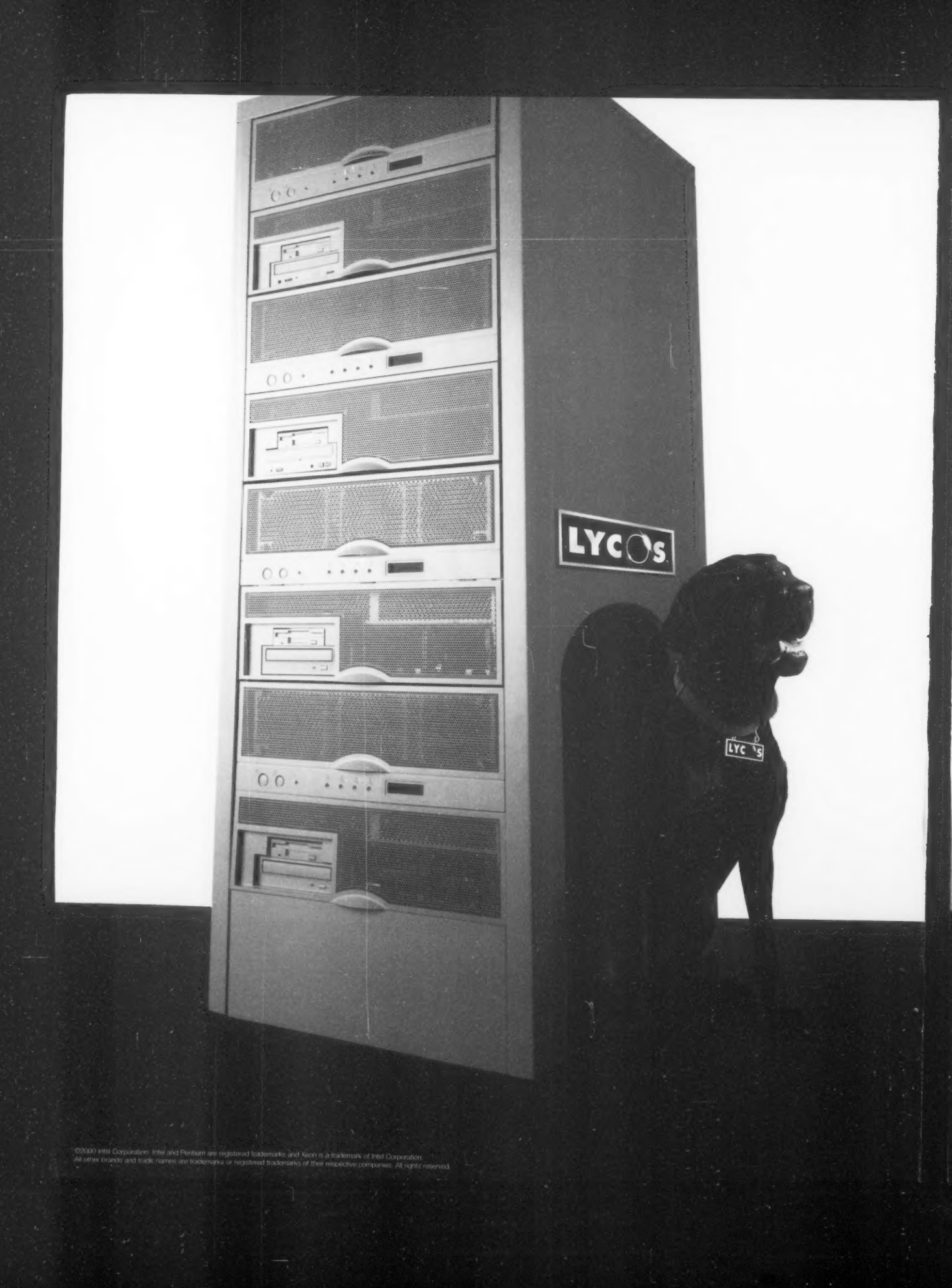
Pro-Palestinian hacker groups, some of which have links to international terrorist Osama bin Laden and anti-U.S. terrorist organizations, have vowed to launch a new round of cyberattacks as part of an ongoing wave of violence that began this fall between Israelis and Palestinians. As of last week, pro-Palestinian hackers had attacked as many as 40 Web sites around the world, and pro-Israeli groups had hit more than 15.

To date, both sides have managed to penetrate Web servers and deface Web pages as part of a sustained disinfor-

Cyberwar, page 141

NEWSPAPER

$BXBBJFT$ $$$$$$$CAR-RT SORT$$B-052
$48106UIZ984PB013$ NOV 01 007 14273
U M I 224
U M I
PO BOX 984
ANN ARBOR MI 48106-0984



©2000 Intel Corporation. Intel and Pentium are registered trademarks and Xeon is a trademark of Intel Corporation.
All other brands and trade names are trademarks or registered trademarks of their respective companies. All rights reserved.

mission:

streamline the network of websites trusted by millions.

critical:

use the platform trusted by millions.

why did the lycos® network choose intel®-based servers and the microsoft® web platform to run one of the most visited hubs on the internet? because they believe it's the only way to run an e-business like theirs. the size and complexity of their network of sites call for a seamlessly integrated platform, one that simplifies management and thrives under the pressure of billions of hits. the intel-microsoft solution provides the interoperability of hardware, operating systems and applications that the lycos network relies on. many of the world's leading e-businesses have examined their platform options and come to the same conclusion: when your mission is total reliability, intel-based servers and the microsoft web platform are critical. see more case studies → *intel.com/go/lycos*

Microsoft® | intel

servers	software	solution
• 2-way intel® pentium® III processor-based compaq proliant servers • 4- and 8-way intel® pentium® III xeon™ processor-based compaq proliant servers	• microsoft® windows® 2000 server • microsoft® visual studio® 6.0 • application center 2000	• reliable, seamlessly integrated platform with a clear road map to the future.

BACKUP EXPRESS

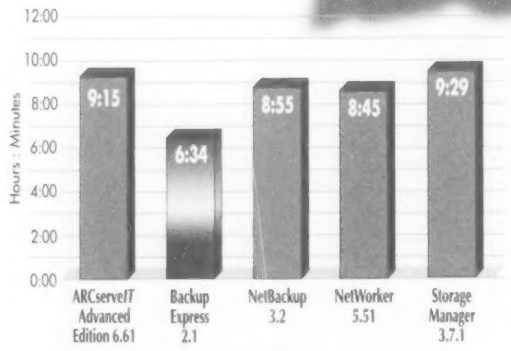
Chosen the Best Enterprise Backup Solution

Independent Test Results

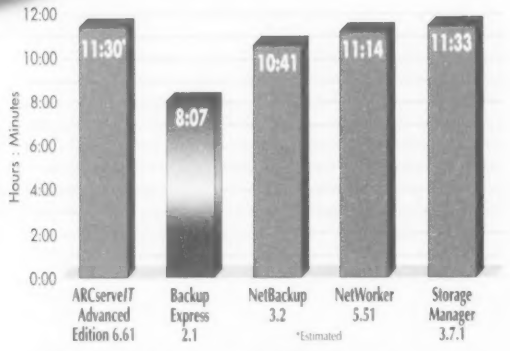
"Taking into consideration all the test factors, including scalability and support, I give the overall edge to Backup Express for its excellent performance and midrange pricing."

"Backup Express' backups and restores were faster than those of the other products."

Tom Iwanski, senior product reviewer,
Windows 2000 Magazine Lab Report (June 2000)



Fastest Backup

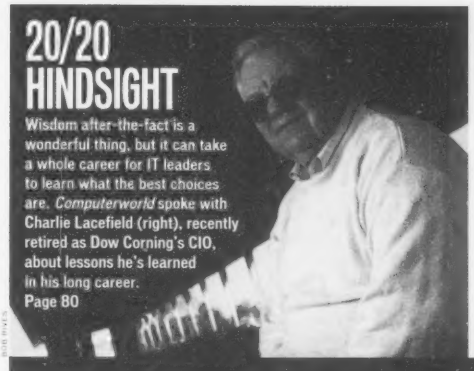


Fastest Restore

For a FREE copy of the Lab Report or to learn more about Syncsort's Backup Express, visit www.syncsort.com/B0cwb or call (201) 930-8200.

syncsort

50 Tice Boulevard · Woodcliff Lake, NJ 07677
(201) 930-8200
www.syncsort.com



20/20 HINDSIGHT

Wisdom after-the-fact is a wonderful thing, but it can take a whole career for IT leaders to learn what the best choices are. *Computerworld* spoke with Charlie Lacefield (right), recently retired as Dow Corning's CIO, about lessons he's learned in his long career.
Page 80

SELLING TEENS ON TECHNOLOGY

Nerds. Geeks. Workaholics. That's still many teens' image of IT workers today. Their view: Using technology – great! Working in technology – anything but cool. But a new national campaign being launched this month called GetTech hopes to change that negative image.
Page 82

COMPUTERWORLD THIS WEEK

NOVEMBER 13, 2000

NEWS 6

6 **WEB SITE PLAYS** a key election role: Voters swamp Florida's site, but Gore staffers manage to get data to spur the recant of his concession.

7 **PRIVACY WILL REMAIN** a political football for high-tech firms, no matter how the vote goes.

8 **RESEARCH PAYS OFF** for firms using Web exchanges to sell or license patented technology they haven't marketed.

10 **BANKS GIVE IN** to a demand for aggregators that link many accounts, after strongly resisting.

12 **SERVICES CONQUER** product-heavy Comdex as the ASP model proliferates.

14 **DOT-COMS CONTINUE** to crash; Pets.com, MotherNature.com and Furniture.com burn out their capital.

16 **ORACLE'S STOCK DIPS** as software sales remain lackluster and users hesitate to upgrade.

24 **INSTANT MESSAGING** may explode this year as standards develop.

30 **LUCENT RESTRUCTURES** management and cuts 240 jobs in a push to integrate sales and service.

MORE

Editorial/Letters . . 32, 33, 40, 44
How to Contact CW 140
Shark Tank 142
Company Index 140

BUSINESS 49

50 **A GUN PLATFORM** in the North Sea provides a home for a data haven that promises to destroy clients' data rather than hand it over to the feds.

DIVERSITY

55 **MINORITIES SOMETIMES** have to act with daring to make their marks in IT, Kathleen Melymuka writes.

56 **WEB SITES ARE FAILING** to attract sufficient advertising or revenue, so some are turning to outsourcers to sell their products directly — for a cut.

WORKSTYLES

60 **MARRIOTT OFFERS** its hospitality culture in the office and a job development program in which workers choose their IT paths.

62 **ARE CHIEF PRIVACY** officers, the newest must-have executives, taken seriously?

68 **PRIVACY GAFFES** are easy to make and hard to recover from; here are the ones that can sink you the quickest.

TECHNOLOGY 93

94 **ENERGY DEPARTMENT** turns to searchable video for fast access to archives for its nuclear emergency response team.

HACK OF THE MONTH

96 **ONLINE RETAILERS** must shore up their security as the holiday shopping season nears, says Deborah Radcliff.

SECURITY JOURNAL

100 **JUDE GETS** the green light to recruit more staff and is amazed by candidates' salary demands.

FUTURE WATCH

104 **MASSIVE PARALLELISM** offered by DNA computing intrigues scientists, but it's not easy — or quick.

115 **SQL SERVER 2000** stacks up against the competition from Oracle and IBM, say early users.

120 **PREDICTIONS OF** impending doom for the router are premature, but there are changes ahead, say experts.

ONLINE

Is Linux ready for prime time? After reading the article by West Coast Editor **Mark Hall** (left) on page 108, post your opinion in our interactive **Linux Forum**. *www.computerworld.com/linuxforum*

What's the best way to spend your security budget? How much for education, technology and developing processes? **Patrick McBride**, a co-founder of security firm METASeS, offers advice in our **Security Forum**. *www.computerworld.com/security*

Online privacy is getting to be like the weather, writes West Coast Bureau Chief **Pimm Fox** in the **E-Commerce Community**: Everyone has an opinion, but nobody seems to do much about it. *www.computerworld.com/ecommerce*

OPINIONS

32 **MARK HALL** says techno-junkies like to play with "toys," but meeting the people behind them is just as crucial; that's why we have a Comdex show.

32 **DON TENNANT** takes a whimsical look at Microsoft's response to hacker attacks on its internal network.

33 **ALLAN E. ALTER** says the open-source software movement could open up the possibility of new methods of leadership.

36 **DAVID FOOTE** writes that many popular IT salary studies are flawed.

36 **THORNTON MAY** says that trust will define the future of the digital economy.

60 **PETER G.W. KEEN** writes that business needs to focus on a different message regarding wireless technology.

90 **JOE AUER** advises that before signing an outsourcing contract, you should be sure service levels are specified.

142 **FRANK HAYES** offers his 10 commandments for beating age bias in IT.

Florida's Election Web Site Swamped by Millions of Hits

Up-to-date info swayed Gore's decision

BY PATRICK THIBODEAU

It was supposed to be a busy but routine election night for the Florida Department of State IT department. But in the span of 24 hours, its Web site was besieged by hordes of visitors, and it would ultimately play a small but perhaps critical role in the election night drama.

While many visitors had trouble accessing the detailed election results, some did get through election night. Among them were members of Vice President Al Gore's campaign, who were searching for the latest voting tallies as they fought to keep their campaign alive.

As new numbers were posted on the Web site, showing a narrowing voting gap with Texas Gov. George W. Bush, they helped lead to Gore's decision to retract his earlier concession. "The data off the Web site was compared with the [results collected by campaign members], and those were consistent," said Gore campaign spokesman Dag Vega.

Of course, the Web site's part in helping to persuade the Gore campaign to keep fighting wasn't immediately known to the department's IT workers. They were too busy.

By Wednesday morning, traffic on the department's Web servers was three times that of a normal election load and rapidly rising. IT workers were scrambling to add more resources to keep the site from completely bogging down.

"It's so overloaded right now [Wednesday morning], you just get a message [that says], 'Too busy, too busy, too busy,'" said one IT staffer, who quickly handed off inquiries to Department of State CIO Gene Bryan.

The state Web site typically gets around 450,000 hits during an election, but Bryan said he expected this race to bring around 700,000 hits. To prepare, his team planned for 24-hour staffing to keep the site updated and running smoothly. But traffic quickly soared as numerous news sites inserted links to Florida's Web site. NBC even showed a live page view on television.

By midafternoon Thursday, traffic had exceeded 5.2 million hits, said Bryan. The department quickly added a fourth Web server around midday to help ease the crunch. "Hopefully, quite a few people are getting in, and only a few are getting a busy signal," Bryan said.

"Nobody expected this," he said. "Of course, nobody expected the vote to be so darn close all over the country." ◗

VICE PRESIDENT Al Gore

TEXAS GOV. George W. Bush

AT A GLANCE

Tied Up

The close vote has given Florida's Department of State an IT challenge:

- Typical election: About 450,000 hits
- This election: 5.2 million-plus

Online Vote Bidding Declared a Web Hoax

Case highlights jurisdiction woes

BY LEE COPELAND

After changing its Web address twice to avoid the long arm of U.S. law, Vote-Auction.com halted its quest to sell ballots to the highest bidder and said it had been a hoax all along.

In an apparent effort to draw attention to the link between campaign financing and the ballot box, the Web site offered to proffer votes to the highest bidder. But analysts and experts said the prank underscores a need to address the jurisdiction issues that arise from Internet-based businesses.

"We've increasingly seen gambling sites try to exploit the legal differences in different areas by moving their services to new locations," said Jay Stanley, an Internet policy analyst at Forrester Research Inc. in Cambridge, Mass. "You can expect an increased amount of cooperation between consumer-protection and antitrust agencies in different countries to address the a-geographical nature of the Internet."

The Vote-Auction.com site purportedly allowed voters to sell their votes to the highest bidder in blocks broken down by state. The winning bid price was to be divided among voters from that state who had registered on the site.

On the eve of the election last week, 1,116 Massachusetts voters allegedly had registered on the site to sell their votes, which caused that state's attorney general's office to seek a court injunction to shut down Vote-Auction.com.

The site, launched as an apparent lark by New York graduate student James Baumgartner, was already ordered to be shut down last month after running afoul of the Chicago Board of Election Commissioners under the original *www.voteauction.com* name. As part of the court order in the case, the judge specifically said Baumgartner's site couldn't reappear on the Web under a different name.

But the site resurfaced under its new name and owners, running on a server operated by an Austrian company. And even though Massachusetts state officials won an injunction, the site changed its name once again, to *http://vote-auction.enemy.org*, on Election Day.

The issue of legal jurisdiction is a contentious one, said Jorge Contreras, an attorney with the Internet law group at Hale and Dorr LLP in Boston. "If you have an activity that is illegal in the U.S., even if it's conducted from outside the country, it is subject to U.S. law," he said.

Online vote-swapping services also sprang up during weeks leading up to the election. Voteswap2000.com and VoteExchange.com both tried to persuade Democratic voters in states heavily favoring either Al Gore or George W. Bush to exchange votes with Ralph Nader supporters in hotly contested states.

Continued from page 1

Voter System

ized voter registries.

The federal government grants each state control over its own voter registration systems. The most recent Federal Election Commission (FEC) study, from 1997, showed that just 10 states had real-time, online access to a centralized voter site. At the other extreme, 16 states had no statewide database at all. A *Computerworld* survey of a dozen states showed that while some have made progress, many others are still struggling to update their IT systems.

"Clearly, there are a lot of things that could get fixed and probably should get fixed," said Kimball Brace, president of Election Data Services Inc., the Washington-based consultancy that the FEC commissioned to conduct the study. "One of the big problems is that many jurisdictions don't have a lot of money."

Wisconsin, one of the states with no centralized registry, allows voters to register on Election Day. Last Tuesday in Madison, more than 50,000 people took advantage, forcing the city to print out extra voter registration cards, noted Ray Risher, the city's director of revenue.

There were no on-site computers or master lists to check names. But Fisher said the state was more concerned with making it as easy as possible for people to register than it was with the possibility that someone may have registered and voted twice.

"It would be nice to have a computer system, but I don't think we could afford the price of the equipment," Fisher said. "Plus, we are dealing with poll workers, many of whom are elderly and do this as part of their civic duty. Most would not be familiar with the operation of a computer."

Another of last week's most hotly contested states, Florida, has a centralized database in Tallahassee. A state law that took effect Jan. 1, 1998, established it. But the state's 67 counties aren't connected to the central repository via the Internet or any private network, and updates aren't done in real time.

"You're talking about a lot of money to put computers and networking [technology] in all the offices of the supervisors [of elections]," said Kurt Browning, the election supervisor in Pasco County, Fla., for the past 20 years. "It was like $15 million to $17 million."

And election supervisors weren't exactly enthusiastic about the idea, according to Browning. The supervisors are independently elected constitutional officers in Florida, and "there were some supervisors that got their backs bent out of shape when they found out Tallahassee wanted to create a central voter registration database," said Browning, noting that he favored the idea.

Instead, the state opted for a central voter file that cost far less. Updates from the counties are now required on a quarterly basis, said Wesley Wilcox, a systems administrator for St. Lucie County's supervisor of elections.

Various checks are made to ensure that residents are eligible to vote, but that doesn't catch every problem. St. Lucie County does birthday and Social Security number checks and periodically sends voting records to be "cleaned" against a national change-of-address database.

"They come out with a probability of death [as in], 'There's a 75% chance this person is

High-Tech Agenda Unaltered by Vote

Privacy likely to be key issue next year, but industry is divided on how to approach it

BY PATRICK THIBODEAU
WASHINGTON

ALTHOUGH THE election has narrowed the party gap in Congress, it hasn't fundamentally changed how the high-tech industry will approach legislative issues in the upcoming session. High-tech groups and companies have so far enjoyed bipartisan consensus on many key issues, and they expect that to continue. But they face one big trouble spot: privacy.

Privacy legislation is likely to take center stage when the new Congress convenes in early January. But the high-tech industry is divided on how to approach the issue, and efforts are under way to build a consensus.

Some firms, including Intel Corp., are in favor of some limited privacy regulations. But others, led by the Arlington, Va.-based Information Technology Association of America (ITAA), oppose any kind of comprehensive privacy legislation, fearing unintended consequences for high-tech firms.

"The industry is still sorting out where it is on privacy," said Michael Maibach, Intel's vice president for government affairs and its top executive in Washington. To the extent that the industry appears united, he said, "high-tech is pretty good at convincing the U.S. government of the best policy."

Citing ongoing discussions, Maibach declined to disclose just what he would like to see in a privacy bill.

One of the key motivators for supporting privacy legislation is the notion that federal laws would preempt state privacy laws, which have the potential to create a patchwork of regulations. But Harris Miller, president of the ITAA, contends that support of privacy legislation as a means of preempting state laws could deliver "the worst of all possible worlds" because there is no guarantee that Congress will risk upsetting the states and preempt state law.

In any case, the real wild card in the changing of the guard in Washington will be the presidential appointees. The new administration will have its greatest impact on technology policy largely through appointments, and a key one will be the selection of the chief of the U.S. Department of Justice's (DOJ) antitrust division, which has spearheaded the Microsoft case.

But the Microsoft case may be moving too swiftly for any new president to attempt to derail the U.S. Court of Appeals process with a push for a settlement. The appeals court will hold oral arguments Feb. 26 and 27, and a new antitrust chief "is not going to be confirmed by the time of oral arguments — there's no way," said Ken Wasch, president of the Software & Information Industry Association, a Washington-based trade group that's backing the DOJ in its effort to break up Microsoft.

If a settlement effort is initiated by a new administration, it will likely come after the appeals court makes its decision, said Stephen D. Houck, former lead trial counsel for the 19 states involved in the case against Microsoft and now an attorney at Reboul, MacMurray, Hewitt, Maynard & Kristol in New York.

Regardless of the new president's feelings about the case, the federal government also has to work with the 19 states that are party to the suit. Those states "would have considerable influence" in any decision to settle, said Houck. The states "have been involved in all the strategic decisions."

Coaxing Congress

The top high-tech issues for the coming year include:

- **Privacy:** Companies are divided on the need for privacy legislation and are trying to reach consensus.
- **Taxes:** The Internet tax moratorium expires next October.
- **Labor:** Now that the H-1B visa issue is settled, the focus will shift to education and training assistance.
- **Trade:** Further reductions in barriers will be sought.

dead,'" Wilcox said. "Typically, we don't act on that stuff. Most are notifications from a spouse or relative."

Even states with available real-time online systems face challenges. Texas gives its 254 counties the option to use its Texas Voter Registration System (TVRS). A total of 135 counties that don't have local systems avail themselves of TVRS, using client software that connects to the database via the Internet or a terminal server.

Yet scores of larger counties in Texas keep their own voter registration systems and update TVRS using tapes or file transfer protocol files. Others connect to TVRS using client software for updates. And some communities slip through the cracks. The rural desert county of Loving, near El Paso, has more registered voters than residents.

"Texas gives out money based on the number of voters you've got. It's basically a county-by-county system," said Jim Edwards, systems manager for the secretary of state. "The places like Loving County that need [money] the most get it the least."

Edwards added, "One of the problems we've got is we need to standardize."

The lack of uniform standards sometimes can prevent states with updated technology from making all the checks they might like. Tennessee has a central voter registry that's accessible online, but there's no system in place to cross-reference voter lists with Tennessee's eight bordering states.

"We would like to be able to match with them, but the problem comes down to Social Security numbers and whether we can get that information," said Steve Griffy, assistant director of information systems for Tennessee's secretary of state, noting that some neighboring states don't request voters' Social Security numbers.

Right now, some states can't even settle on a uniform format for voter registration. Ron Michaelson, executive director of Illinois' State Board of Elections, said a uniform format "has been required by law for 15 years but has not been done due to lack of funding."

Another source of problems for Illinois and other states has been the National Voter Registration Act, better known as the "motor voter" law, which lets voters register by mail or when they get their driver's licenses. Because the law prohibits voting districts from purging inactive voters from the rolls, they are left with "rolls that are not as clean as they used to be," Michaelson said.

Even the intended benefits of the motor voter law aren't always realized. Virginia encountered a problem with residents who thought they had registered at the Division of Motor Vehicles (DMV) only to discover that they weren't registered when they arrived at the polls. Technology could help solve that problem if applications could be routed electronically from the DMV to the Virginia Voter Registration System. But right now, under Virginia law, the signature must be original and can't be scanned or digitized.

Virginia's Board of Elections has been pushing for electronic signatures to be made legal, but it has had no luck so far.

That's also true for anyone hoping that a national voter registry might bring some order to the chaos.

"I think sometime we will have a real-time federal registry," said Browning, 42. "I hope I live long enough to see it."

Reporters Michael Meehan and Marc L. Songini contributed to this report.

BRIEFS

Online Registrations In Illinois Were Invalid

People in Illinois who registered to vote via a Web site were in for a surprise last week: They couldn't vote. Any civic organization can register voters, but it must use particular paper forms. "We indicated the requirement to online voter registration outlets that we knew of," said Ron Michaelson, executive director of the Illinois State Board of Elections. "Some informed their clients; some evidently did not."

How the Media Sites Held Up Election Night

E-commerce reporting firm Keynote Systems Inc. in San Mateo, Calif., found delays on some news and political Web sites during the election.

For example, Keynote reported that MSNBC's average response time between 6 and 9 p.m. EST Tuesday was 32.54 seconds, with the page loading 59% of the time. Media Metrix Inc. in New York said MSNBC's number of unique visitors increased from 747,000 to 2.64 million between Nov. 5 and 7. Some sites increased their load but performed just fine, Keynote said. Election reporting put CNN.com, which went from 841,000 unique visitors on Nov. 5 to 3.5 million on Election Day, in that group.

GOP Goes Off-line After Hit by Hacker

The Republican National Committee's Web site was temporarily taken down early on Election Day after an intruder placed a rambling tirade against Texas Gov. George W. Bush. The anonymous hacker included a link to the Web site of Vice President Al Gore's campaign at the end of the message. Both *www.rnc.org* and *www.gop.org*, which also directs users to the GOP committee's Web site, were affected. At noon, a two-sentence text message indicated the site was being restarted.

The hacking method used was probably a fairly common one, such as Remote Data Service scripting, which lets attackers take control of Web servers, said David Kennedy, director of research at TruSecure Corp., an Internet security consultancy in Reston, Va.

Corporate Secrets Up for Grabs at New Exchanges

Companies putting patents, trademarks and more on sale

BY JULIA KING

LIKE MOST corporate giants, Procter & Gamble Co. (P&G) and General Electric Co. used to guard their patents, trademarks and other intellectual property more closely than the crown jewels.

But now, under pressure to fatten revenue, they and other companies are offering everything from prized research-and-development secrets to sharp in-house information technology systems for sale at new online intellectual-property exchanges.

The buyers are other big companies looking to slash R&D costs by buying the fruits of others' research.

About 20 such exchanges, including Cambridge, Mass.-based Yet2.com and Pasadena, Calif.-based The Patent & License Exchange Inc. (*http://pl-x.com*) have either been announced or are up and running. Last week, St. Cloud, Minn.-based Global Commerce and Communication Inc. leaped in with NewIdeaTrade.com, a free online forum for buyers and sellers of inventions, trademarks and patents.

Also last week, in a slight twist on the same theme, Mountain View, Calif.-based 2000Ideas.com launched what it calls a "people-to-business marketplace," where individual consumers and others can submit ideas and technologies to the people within companies who are responsible for new product development. The Coca-Cola Co., Daimler-Chrysler AG, International Paper Co. and S.C. Johnson & Son Inc. are among the marketplace's inaugural corporate members.

What the business-to-business marketplaces offer, users say, is a fast, efficient and extremely low-cost way to transfer technology and build revenue on inventions that otherwise might not have seen the light of day.

"A year and a half ago, we did a survey and realized we were spending $1.5 billion on research and development, but we were using less than 10% of it in our own products," said Jeff Weedman, vice president of global licensing and external ventures at Cincinnati-based P&G.

BILL HEISE at Eastman Chemical uses the Net to find technology buyers

The consumer goods giant, which holds 27,000 patents, has changed its intellectual-property philosophy dramatically. Now, all its patents as well as other technologies are available for licensing, sale or joint ventures, Weedman said.

So far, Yet2.com has signed up 56 members worldwide, including P&G, Toyota Motor Corp., Royal Dutch/Shell Group, Siemens AG and NEC Technologies Inc.

Companies pay about $10,000 per year to post an unlimited number of offerings on the exchange, according to Yet2.com CEO Chris DeBleser. After that, royalty fees on the sale of products incorporating a technology or patent range from 0.5% to about 3%. The exchange collects a finder's fee of 10% of the royalties. Some subscribers, including P&G, have also invested in the exchange itself.

P&G has not closed a deal in the four months it has been a member of the exchange, Weedman said, but it has been introduced to several potential buyers far afield of the consumer goods industry.

One example is a contact-lens manufacturer interested in licensing a biodegradable enzyme that P&G developed and uses in one of its flagship laundry products, Tide. As it turns out, the same enzyme that is effective in removing oil from laundry may make an excellent nonabrasive lens cleaner.

Slow Progress

So far, Yet2.com has booked revenue of less than $1 million, according to DeBleser, partially because it usually takes six months for a buyer to implement new technology and an additional six months for new products to hit the market and build royalties for the exchange, he said.

Bill Heise, director of licensing at Eastman Chemical Co. in Kingsport, Tenn., subscribes to The Patent & License Exchange, which he browses regularly for potential technology buyers outside of the chemical industry.

Eastman owns about 1,500 U.S. patents. "I view the Internet as a vehicle to find the right people to license this technology," Heise said.

Eastman also uses proprietary measuring tools on the Patent & License Exchange site to get a handle on the financial value of various technologies, patents and know-how in Eastman's portfolio of intellectual property.

In addition to patented technologies, GE's Industrial Systems Division also plans to sell innovative systems its IT people have created that the company would never have thought to market otherwise, said Dave Christensen, manager of intellectual property at the business unit in Plainville, Conn.

Oilily Expects Payoff From System in One Year

$2M project will cut apparel lead times

BY MARC L. SONGINI

A Dutch manufacturer and clothing retailer is preparing to install a $2 million supply-chain system that's expected to pay for itself within a year by cutting plant-floor lead times and reducing other operational bottlenecks.

Olly's BV, also known internationally as Oilily, will be swapping out homegrown Cobol software for a Windows- and Unix-based software package. The application will handle wholesaling, retailing, purchasing, stockpiling and other supply-chain-related activities, starting in April.

The project reflects a trend among apparel makers to migrate away from stodgy, homegrown supply-chain applications to packaged applications that are geared more toward streamlining plant-floor activities, said analysts.

"The biggest weapon in fashion apparel is speed," said Greg Girard, an analyst at AMR Research Inc. in Boston. Being able to handle different assortments and sizes and moving products quickly is "absolutely critical," he said. Girard added that it wouldn't be unreasonable to see Oilily recover its $2 million investment within 12 months.

Providing the new software is New York-based Essentus Inc., which specializes in supply-chain applications for the footwear and apparel industries. Consulting fees in Europe are generally lower than those in the U.S., contributing to the lower-than-usual cost for the implementation.

Projected Gains

The rollout at Alkmaar, Netherlands-based Oilily is slated to be completed by summer 2002. "The gains will show not only in dollars but in customer loyalty, which you cannot directly measure in money," said Willem Olsthoorn, president and founder of the $100 million company.

Oilily Beefs Up Supply Chain

Oilily's supply-chain implementation will cost about $2 million.

The company expects to recover that sum in a year because of process improvements in procurement and warehousing. It also expects to increase customer satisfaction and loyalty.

The system is expected to enable Oilily to manage its stock more efficiently; cut lead times for manufacturing by 10% to 15%, reducing it to a couple of weeks; and deliver product faster than before.

A distributor to 2,600 stores in 42 countries, Oilily has a far-flung supply-chain, manufacturing and distribution network, said Olsthoorn.

The company buys fabrics from Italy, zippers from Japan and other materials from around the world. These components are shipped to the Netherlands, where they are forwarded to factories in Yugoslavia for assembly. The finished product goes back to the Netherlands for global distribution, illustrating just how intricate the company's supply chain is, Olsthoorn said.

It's more expensive for apparel makers to build, evolve and maintain customer manufacturing applications than it is for them to buy off-the-shelf software, making their move to packaged applications inevitable, said AMR's Girard. Still, companies will need to custom-tailor any software they acquire, which typically inflates those costs by a minimum of 10%, he said.

Girard noted that Liz Claiborne Shoes, a Jacksonville, Fla.-based subsidiary of Liz Claiborne Inc., also recently bought Essentus supply-chain modules to manage its manufacturing activities.

When It Comes To Security, Only *e*Trust Can Protect You Like This.

Security is the number one concern of every IT professional. The good news is that there's a proven solution you can trust.

Without Bullet-Proof Security, Successful eBusiness Is Impossible

The only thing bigger than the opportunity that comes with putting your business on the Web is all the risk that goes with it.

Undetected attacks can strike at any time, from anywhere, in a variety of forms. Most sites can't even track every attempt. And new threats are developed every day, all over the world.

Without the right protection, eCompanies risk losing everything: data, customers, revenue, and more.

A Simple Solution To Your Most Complicated Challenge

Online business through eCommerce, corporate intranets, partner-to-partner transactions on extranets and websites, all need to be secured. Protecting the integrity and availability of intranet information is critical to all organizations.

Unfortunately, in the race to become Web-enabled, security has taken a back seat. IT managers often give themselves a false sense of security with a standalone or partial security solution. They forget that eCompanies need an integrated and comprehensive security solution that provides best-of-breed functionality.

*e*Trust Enables eBusiness

*e*Trust™ provides all the security solutions an eBusiness needs:

COMPREHENSIVE — From the browser to the mainframe, ensuring complete security in today's highly complex environments.

BEST-OF-BREED — *e*Trust solutions offer best-of-breed functionality across the board.

INTEGRATED— All *e*Trust solutions are designed and built to work together seamlessly.

EASY — *e*Trust solutions are easy to use, deploy, and administer, ensuring any environment is secured quickly and correctly.

MISSION-CRITICAL — *e*Trust solutions offer the scalability, depth, and robustness fast-growing and successful eBusinesses need.

*e*Trust Is Open And Extensible

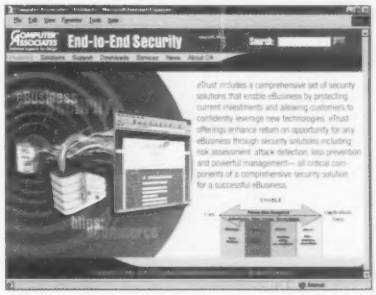
*e*Trust allows you to leverage existing investments in security solutions — you will never have to start over or convert anything.

_e_Trust Security Suite

- Access Control
- Administration
- Single Sign-On
- Firewall
- Content Inspection
- Intrusion Detection
- Policy Compliance
- Audit
- Virtual Private Network
- Encryption
- Directory
- OCSPro
- Anti-Virus

And *e*Trust can be implemented one function at a time or all at once — it's your choice.

And since *e*Trust is built on the Unicenter TNG® Framework,™ it lets you snap-in other eBusiness management solutions as you grow and your needs change. *e*Trust is built on a standards-based, open infrastructure, so it's always easy to plug in any other standards-compliant products or solutions.



*e*Trust Is Trustworthy

*e*Trust is not only backed by the world's leading security software company,* it is also complemented by a complete set of outcome-based service offerings. CA Services™ stands ready to make sure your implementation is fast and trouble-free.

If your company is making the difficult transition to an eBusiness, you owe it to yourself to find out more about the security solution more eBusinesses trust.

For more information, call 1-800-377-5327, or visit www.ca.com/solutions/enterprise/etrust/

COMPUTER® ASSOCIATES
Software superior by design.

*e*Trust™

Backed By The #1 Security Software Company

Assess Manage Protect Detect Enable

© 2000 Computer Associates International, Inc., Islandia, NY 11749. All trademarks, trade names, service marks, and logos referenced herein belong to their respective companies.
*According to "Internet Security Software: 1999 Worldwide Markets & Trends," by IDC.

Banks Join Forces With Online Account Aggregators

BY MARIA TROMBLY

At this time last year, First Union Corp. was suing account aggregator Paytrust Inc. because Paytrust let customers bypass the bank's Web site and access their accounts directly — possibly leading to reliability or security problems.

Since then, the Charlotte, N.C.-based bank has dropped the case — and last week it became an aggregator itself, teaming up with Redwood Shores, Calif.-based Yodlee.com Inc., a partner of Lawrenceville, N.J.-based Paytrust.

Besides handling online bill payment, Paytrust was previously saving customer passwords and logging into other banking and financial sites to give users access to their financial data from one site. Since then, the company has begun concentrating on bill payment and has allied with Yodlee to aggregate account information for their joint customers.

There has been an avalanche of deals combining such services during the past months, sparked by an agreement that allowed Citigroup Inc. customers to use Yodlee's service to view all their accounts on one screen, including bank accounts, brokerage accounts, frequent-flier miles, credit cards and even e-mail. The information can be viewed through either Yodlee's home page or at a private-label site like those that exist with brand-name firms such as Boston's FleetBoston Financial Corp. and New York's Chase Manhattan Corp.

What About Wireless?

The total number of account aggregation users should top 3 million by 2003, according to Christine Barry, an analyst at Newton, Mass.-based Meridien Research Inc. Yodlee and Atlanta's S1 Corp. are the leading vendors so far (see chart).

Yodlee also offers wireless access to accounts. Clients such as Dulles, Va.-based America Online Inc., New York-based Morgan Stanley Dean Witter & Co. and Salem, Mass.-based Salem Five Cents Savings Bank have already begun offering the service to their retail customers.

Analysts are divided as to whether financial institutions or portals will dominate the account aggregation space. But it's already clear that it won't be start-ups like Yodlee that win the battle for consumer eyeballs.

"Financial institutions definitely have the advantage — they're already trusted by consumers for their financial needs," said Barry. "But the portals are presenting themselves as unbiased third parties who aren't going to cross-sell."

Some account aggregators argue that there isn't yet even a call for wireless access. "Wireless is not just one of the things that comes up as a No. 1 requirement," said Roger Berman, CEO of San Ramon, Calif.-based financial account aggregator eBalance Inc., which specializes in analysis tools for individual investors and the financial institutions that serve them.

"How much can you really see on a two-inch screen?" said Jaime Punishill, an analyst at Cambridge, Mass.-based Forrester Research Inc. He estimated that account aggregation as a whole will take at least three to five years to achieve critical mass, mostly because of privacy, security and complexity issues.

"It still requires too much effort and too much of a leap of faith on the customer's part," he said.

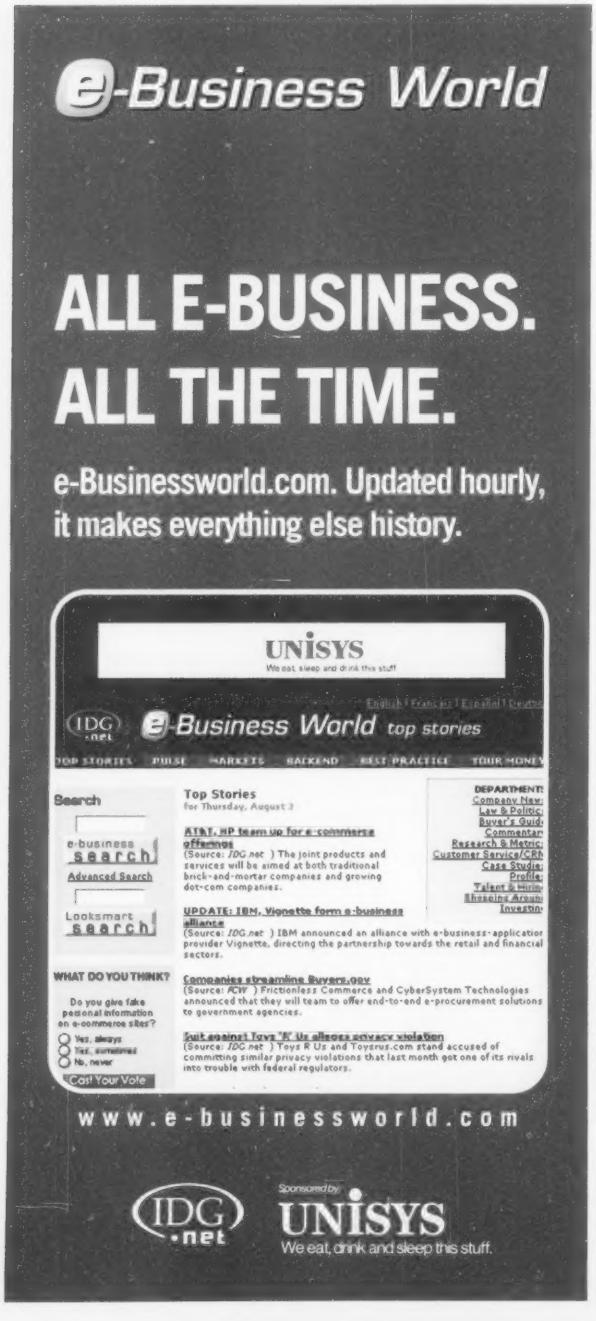
Aggregators

THROUGH YODLEE

- AOL
- Morgan Stanley Dean Witter
- Salem Five Cents Savings Bank
- Citigroup
- FleetBoston Financial
- Chase Manhattan

THROUGH VERTICALONE

- Yahoo
- Wells Fargo
- Centura Banks
- Motley Fool
- iVillage
- SmartMoney.com
- OnMoney.com
- VirtualBank
- Women's Financial Network
- Fiserv Inc.



SNAPSHOT

Wireless Ads Really Do Matter

A wireless advertising study in which users received a total of more than 100,000 messages, including ads, in return for free text messaging showed the following:

60% of the participants said they liked receiving ads targeted to personal profiles they completed.

20% sought more information about the products being advertised after seeing the messages.

Base: 5,000 users in Sweden.
Study sponsor: LM Ericsson Telephone Co., Stockholm

INTRODUCING THE E-BUSINESS SERVER THAT ACTS LIKE A MAINFRAME

Our goal: create the ideal server for big e-business. A server so tough it would stand up to the heaviest loads. So rock-solid reliable you could be open for e-business round-the-clock. In short, a server with the best qualities of a mainframe. Result? The **Unisys e-@ction Enterprise Server ES7000.**

But while it's a lot like heavy metal, our ES7000 is light years ahead of anything else out there. It allows workloads to

be partitioned over 32 Intel® Pentium® III Xeon™ processors. And it can run both Microsoft® Windows® 2000 and UNIX at the same time.

The Unisys e-@ction Enterprise Server ES7000. The kind of mainframe-class e-business server you'd expect from the people who invented the mainframe in the first place.

www.unisys.com/ent

UNISYS

We eat, sleep and drink this stuff.

©2000 Unisys Corporation. Unisys is a registered trademark and e-@ction is a trademark of Unisys Corporation. Intel, the Intel Inside logo and Pentium are registered trademarks and Pentium III Xeon is a trademark of the Intel Corporation. Microsoft and Windows 2000 are registered trademarks of Microsoft Corporation.

BRIEFS

Group Calls for Delay in Cybercrime Treaty

The Global Internet Project (GIP), a U.S.-based business group that's trying to head off government regulation of the Internet, last week called for more dialogue on a proposed international treaty on cybercrime issues. Members of the group urged the Council of Europe to delay its self-imposed deadline of next month for completing work on the cybercrime treaty. The Council, which has 41 member countries, released a draft of the treaty last month, and the U.S. and other nations outside of Europe are widely expected adopt the final version. But John Patrick, vice president of Internet technology at IBM and the GIP's chairman, said the proposed treaty could hamper efforts to stop cybercrime. "It's an issue where if we move too quickly to ban the tools used by hackers, we may also ban the tools used by investigators," Patrick said.

ISPs Get Usage-Based Pricing for Servers

IBM and Mercantec Inc. in Naperville, Ill., announced an agreement last week to offer usage-based pricing options for Internet service providers that host e-commerce applications for their customers. For an "initiation" fee, Internet service providers will get as many servers as they need but will be billed only for the number of commerce storefronts actually used by their customers. The pricing model eliminates the up-front cost involved in buying servers for hosting e-commerce applications, the companies said.

Short Takes

A federal judge has ruled that MICROSOFT CORP. has to pay $3.73 million in attorneys' fees and other legal costs to BRISTOL TECHNOLOGY INC. in Danbury, Conn., in addition to the $1 million in punitive damages it already owes in its antitrust case. . . . DELL COMPUTER CORP. matched analysts' expectations by announcing that it closed its third quarter ended Oct. 28 with revenue of $8.26 billion, compared with $6.78 billion for the same quarter last year.

ASP Summit Grabs Comdex Spotlight

Providers seek converts to hosted model

BY MICHAEL MEEHAN

IT'S ABOUT the services, stupid.

At least that will be a message coming from a significant portion of this week's Comdex/Fall 2000 show in Las Vegas.

Known as a products show, Comdex this year will host an application service provider (ASP) summit where ASPs will make the case for their Web-based software and services delivery model.

"[Comdex is] starting to move toward more of a services show," said Larry Buchsbaum, an analyst at Boston-based research and consulting firm The Yankee Group.

The ASP model gained a significant boost this summer when Microsoft Corp. announced its .Net strategy, in which it plans to make all of its software available over the Internet.

Amy Mizouras, an analyst at International Data Corp. in Framingham, Mass., said she believes that commitment has helped validate the ASP business and that customers are starting to perceive that software will be delivered as a service over the Internet in the future.

Yet it's a long way to "best in show" at the largest technology conference of the year. Mizouras said ASP events at previous shows have failed to generate much buzz.

"The real test will be the conversation we have next week on how successful the show was," she said.

Buchsbaum noted that Comdex comes at a shaky time in the ASP industry. He predicted the ASP model will ultimately succeed, but that many of the current players won't survive to see that triumph.

"It's clear there's just a lot of confusion as to what an ASP is and what's the value of an ASP," he said.

David Dobrin, an analyst at electronic-business strategy firm Surgency Inc. in Cambridge, Mass., said part of the value of ASPs putting on the ritz for a show like Comdex was to gain converts to their religion. "Maybe they're trying to recruit people to become ASPs," he said.

Of course, ASPs are also customers at a certain level, and Mizouras said she expects the services crowd to hear a fair number of vendor pitches for hardware, networking and security software companies.

"People want to know how much stuff are they going to buy," she said. "You can be sure there'll be plenty of prospecting going on."

Comdex has always been known as an event where hardware vendors show off their latest and greatest to small and medium-size customers.

Mizouras said she wondered if business applications will stand out amid all the glitz and glitter of the rest of the show. "I don't know that they can compete with the excitement level of a camera mounted on someone's shoe and that kind of techie stuff," she said.

The ASP summit runs Wednesday and Thursday. ▶

(Hosted) Services With a Smile

Here's what will be offered at the Comdex ASP summit:

- Four keynote speeches, including one on redefining the role of the ASP for large enterprises by Aubrey Chernick, chairman and CEO of Candle Corp.
- A two-day set of sessions devoted to the ASP business model and place in the market, including revenue models.
- A two-track session on ASP technology, including how to construct an ASP data center and how to manage security in a hosted environment.

Wireless at Comdex an Evolution

Comdex/Fall 2000 showgoers will see evolutionary rather than revolutionary wireless and handheld products this week in Las Vegas, according to analysts and vendors.

Though Bluetooth personal-area networking technology – designed to use the airwaves to hook printers to laptops, for example – had the buzz a year ago with products expected by the end of this year, vendors will still be exhibiting devices you can only look at rather than buy.

"Bluetooth has a way to go, so you'll still be seeing a lot of prototypes at Comdex and you'll be seeing some interesting chip technology," said Tim Scannell, a Quincy, Mass.-based analyst at Mobile Insights Inc.

Arvind Sabaharwal, director of telecommunications and networks at General Motors Corp. in Detroit, agreed, saying he doesn't anticipate seeing Bluetooth products – which GM plans to use to connect devices in its assembly plants – for another 18 months.

In the handheld device arena, Santa Clara, Calif.-based Palm Inc. plans to unveil new wireless developments at Comdex, as well as provide a "sneak-peek" at a new Palm portal, according to a company spokeswoman.

Compaq Computer Co., which has developed its iPAQ line of handhelds based on Palm's rival, the Pocket PC platform from Microsoft, plans to introduce its handheld wireless strategy at the show, a spokeswoman said.

Scannell said he doesn't expect to see "anything significant from Palm" at Comdex but he does expect Microsoft and its Pocket PC partners to use the show to "move aggressively" against Palm in the marketplace.

Wireless LANs operating on the widely adopted 802.11B standard have reached a level of maturity not seen in other wireless products at Comdex. Elliott Hamilton, an analyst at Strategis Group in Washington, said potential buyers will see reduced prices.

"Costs are definitely getting cheaper for wireless LANs," Hamilton said. "We're seeing a lot of [Internet service providers] and resellers entering the market."

Though mature and backed by industry heavyweights, including Lucent Technologies Inc. in Murray Hill, N.J., and Cisco Systems Inc. in San Jose, the 802.11b standard faces a battle for the 2.4-GHz frequency band from the standard backed by the HomeRF Working Group, an equally high-powered collection of companies that includes Intel Corp. in Santa Clara, Calif., Motorola Inc. in Schaumberg, Ill., and Compaq.

This year's Comdex will be the first, highly visible skirmish between the two camps, according to Scannell. Because the two groups advocate the use of different technologies to spread signals across the spectrum, Scannell said both plan to use Comdex to launch "strong campaigns" for their potentially conflicting technologies. ▶

– *Bob Brewin*

Best Buy to Offer Choice In Broadband

BY DAN VERTON

Best Buy Co. last week said it plans to offer broadband Internet services from several leading vendors at more than 400 retail locations.

The Eden Prairie, Minn.-based company plans to install interactive displays at its retail locations to let consumers compare high-speed Internet services from a half-dozen providers. Although other major retailers, such as Richmond, Va.-based Circuit City Stores Inc., already offer broadband Internet access services, the Best Buy announcement signals the full-fledged entry of broadband technologies into the retail sector, say analysts. Best Buy will get a percentage of all sales at its retail outlets.

"This is a good shot in the arm for broadband, and something that the market needed," said Jack DaQuano, a senior analyst at Hurwitz Group Inc. in Framingham, Mass. ▶

Don't let your
e-commerce deployment
become a sci-fi
thriller.
Find out about the best strategies and solutions
to build your business.
WebSolutionsWorld.com
Visit www.websolutionsworld.com to be prepared for anything and
everything. You never know what lurks out in the ether.
IDG.net
ALADDIN
COMPAQ
intel
Microsoft
protegrity
SurfControl
WEBRIDGE

Lack of Funding Forces More Online Retailers to Shut Down

Furniture.com, MotherNature.com among many unable to hold on

BY LINDA ROSENCRANCE

Three more electronic businesses were unplugged last week, joining the ranks of other online retailing failures.

Furniture.com Inc., Pets.com Inc. and MotherNature.com Inc. disclosed last week that they were discontinuing operations due to fiscal troubles.

In a statement, Furniture.com said it was having "difficulty securing sufficient capital to fund operations going forward."

The Framingham, Mass.-based online seller of furniture and other home furnishings said it was shutting down its site and looking to sell off its assets, though company officials couldn't be reached to comment on a timetable for those plans.

Furniture.com's announcement came less than three months after online rival Living.com Inc. in Austin, Texas, closed its virtual doors after running out of money.

A spokeswoman for the venture capital unit of CMGI Inc. in Andover, Mass., which has a seat on Furniture.com's board of directors, said the online retailer suffered from a problem that has befallen many other e-commerce start-ups: poor back-office and product-distribution systems.

Business Plans Crucial

Analysts say that many online retailers have paid too much attention to marketing and not enough to developing solid business plans.

David Cooperstein, an analyst at Forrester Research Inc. in Cambridge, Mass., said many of the failed companies didn't bother to establish solid supply chains, reliable customer service and financially sound business practices.

"Investors no longer are giving companies ridiculous amounts of money so they can blow it on marketing," he said.

Online retailers that are expected to succeed will be those with solid business plans behind their flashy Web fronts, said Harry Wolhandler, an analyst at ActivMedia Research LLC in Peterborough, N.H.

"[These companies] have to attend to their [back-end] operations" and satisfy their customers with solid service and reliable shipping — regardless of what niche they may operate in, Wolhandler said.

San Francisco-based Pets.com said it plans to shut down its online pet-supply store and sell off its assets, including its well-known talking sock puppet. The company said it had been unsuccessful in obtaining new capital or finding a buyer.

Concord, Mass.-based MotherNature.com, another company backed in part by CMGI, announced that it, too, was shutting down due to a lack of funding, less than one year after going public.

MotherNature.com isn't the only online seller of vitamins and health care products that has faced financial hardship.

Last month, Drugstore.com Inc. in Bellevue, Wash., said it plans to lay off 10% of its approximately 600 employees in the wake of a net loss of $33.3 million for the third quarter. Meanwhile, Eve.com Inc. in San Francisco also announced plans to shut its virtual doors after it was unable to sell cosmetics profitably online.

And two weeks ago, More.com Inc. in San Francisco said it planned to sell most of its assets to HealthCentral.com in Emeryville, Calif. ◗

Reporters Jennifer DiSabatino and Michael Meehan contributed to this article.

Alpha Licensee Adds Power to Processor Line

Space-saving design among developments endorsing longevity of Compaq technology

BY JAIKUMAR VIJAYAN

THE RECENT flurry of activity around Compaq Computer Corp.'s Alpha processor technology continues.

Last week, API NetWorks Inc., a licensee of Alpha technology, boosted its product lineup with a high-density server and a faster, more powerful chip.

Concord, Mass.-based API is funded by Samsung Electronics Co. in Seoul, South Korea, and is a supplier of Alpha chips to Compaq.

The company was formed a few years ago mainly to market and promote Alpha technology. It uses Samsung's manufacturing facilities to build a line of Alpha processors that includes the recent 64-bit, 750-MHz Alpha 21264 chips.

Sleek Features

API's new CS20 server, announced last week, is a dual-processor system featuring a slim size designed to save space while offering all the performance benefits of a full-size server, according to the company.

Linux Networx Inc., a Sandy, Utah-based builder of high-performance Alpha servers, will use the new systems to build clustered Linux-based Alpha configurations, said Clark Roundy, a vice president at Linux Networx.

A lot of the applications being targeted by Linux Networx require servers that can support a large number of processors, Roundy said. The new API server will allow Linux Networx to pack more processors into its systems without increasing their size, he said.

"A lot of our customers have got limited floor space," Roundy said. It's the reason why "one of the biggest advantages is the density of the new servers," he added.

API's announcement last week builds on other recent Alpha-related developments.

Earlier this year, IBM announced that it would fabricate next-generation copper-based Alpha chips.

And more recently, Stockholm-based LM Ericsson Telephone Co. announced a $500 million partnership with Compaq under which it will base its next-generation switching technologies on Compaq's Alpha processors and Tru64 Unix operating system.

The Ericsson deal gives Compaq a "resounding endorsement for the performance and longevity of Alpha," said editor Terry Shannon in a recent edition of "Shannon Knows Compaq," an Ashland, Mass.-based newsletter.

The deal, in conjunction with IBM's new fabrication role and Alpha's continuing gains in the high-performance market, indicates that Alpha servers are on a roll, he added. ◗

JUST THE FACTS

About API NetWorks

- Markets Alpha processors
- Funded by Samsung Electronics
- Focused on making systems for high-performance Linux-based Alpha servers
- Earned $130 million in revenue last year

VeriSign Testing Multilingual Domain Names

BY TODD R. WEISS

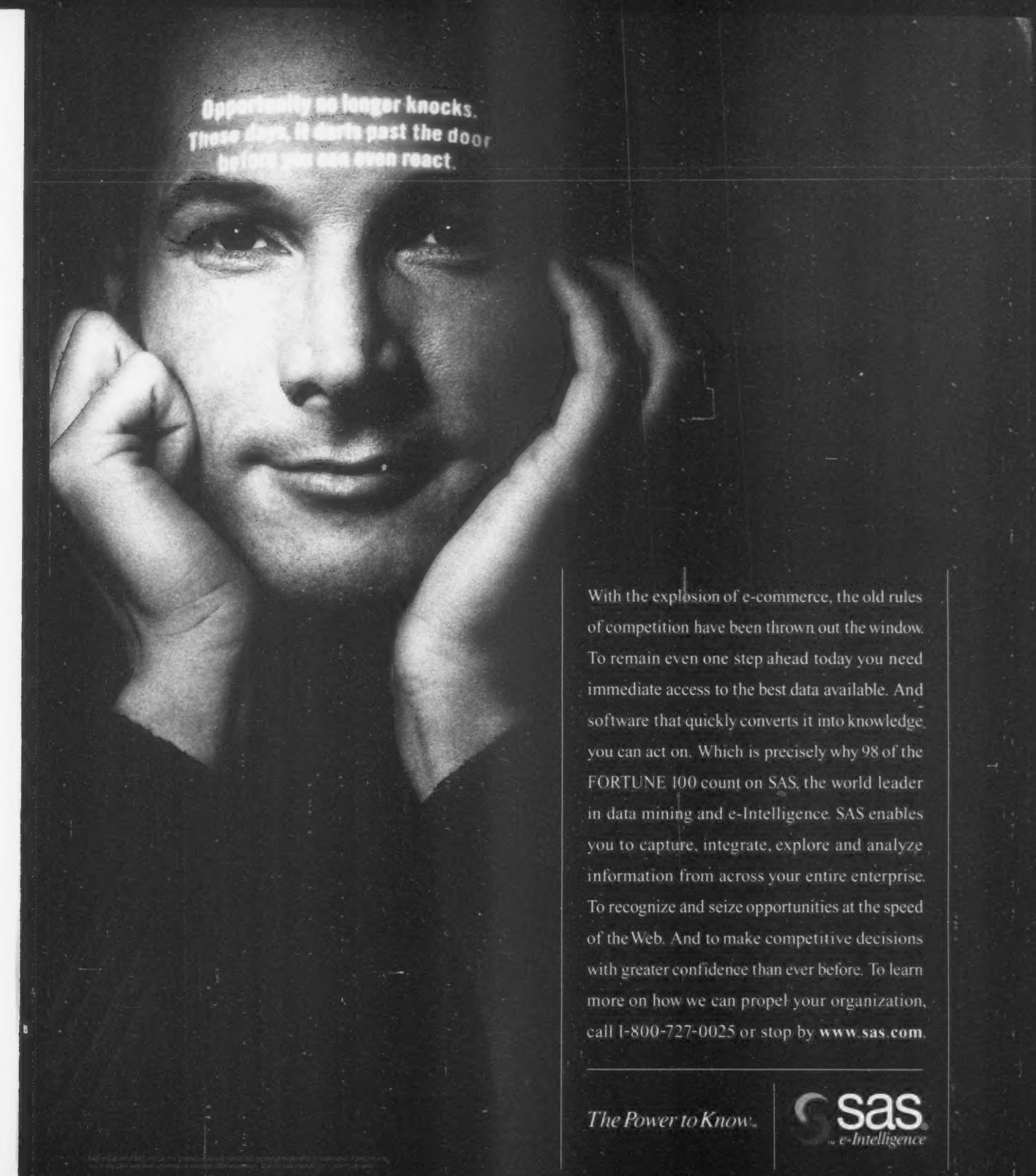
The company that maintains the master database of Internet domain names planned to start testing the use of multilingual Web site names late last week, initially supporting Chinese, Japanese and Korean characters in addition to the English ones now in use.

Support will soon follow for testing domain names that use languages such as Spanish, Portuguese and Arabic. VeriSign Global Registry Services (GRS), which manages the back-end piece of the domain-name registration process, has said the Multilingual Domain Names Testbed is an important step in finding ways to open the Internet to more users around the world. VeriSign GRS is a unit of VeriSign Inc. in Mountain View, Calif.

However, VeriSign GRS said last month in an announcement detailing the test-bed plans that the ultimate disposition of multilingual names registered during the test period is dependent upon the outcome of a standards process being carried out by the Internet Engineering Task Force (IETF).

In addition, the Internet Society, a Reston, Va.-based nonprofit group that acts as the "organization home" for the IETF and the Internet Architecture Board, released a statement last week urging a more cautious approach for the use of non-English characters in domain-name registrations.

The Internet Society, which provides insurance services and other assistance to the IETF but is an entirely separate organization, said it supports the "good intentions" of opening the domain-name system to a wider number of international users. ◗



With the explosion of e-commerce, the old rules of competition have been thrown out the window. To remain even one step ahead today you need immediate access to the best data available. And software that quickly converts it into knowledge you can act on. Which is precisely why 98 of the FORTUNE 100 count on SAS, the world leader in data mining and e-Intelligence. SAS enables you to capture, integrate, explore and analyze information from across your entire enterprise. To recognize and seize opportunities at the speed of the Web. And to make competitive decisions with greater confidence than ever before. To learn more on how we can propel your organization, call 1-800-727-0025 or stop by **www.sas.com**.

The Power to Know.

sas
e-Intelligence

BRIEFS

Luminant Worldwide Plans to Layoff 175

After failing to meet revenue expectations, Web consulting firm Luminant Worldwide Corp. in Dallas announced it will lay off 18% of its workforce, or about 175 employees, reducing the total number of workers to 775. The company said it was also restructuring its business to reach profitability. Luminant's revenue for the third quarter was $38 million, a decline of 5% from the second quarter.

Other Internet consulting firms, including Chicago-based Xpedior Inc., Atlanta-based iXL Enterprises and Boston-based Viant Corp., have also had lower-than-expected third-quarter earnings, due in part to the curtailed electronic-business spending by cash-strapped dot-coms.

IBM Announces WebSphere for Linux

IBM last week announced a version of its WebSphere e-commerce software application to run on the Linux operating system. IBM said the new Linux version of the software will be available from the four major distributors of Linux: Caldera Systems Inc., Red Hat Inc., SuSE AG and TurboLinux Inc.

Transmeta IPO Comes Amid Chip Evaluation

Microprocessor designer Transmeta Corp. launched its highly anticipated 13 million-share initial public offering (IPO) on the Nasdaq Stock Market last week, with shares closing at twice the initial price. But questions about the performance of Transmeta's low-power Crusoe chip – and hesitation on the part of some big U.S.-based computer makers to use the chip – continue to haunt the San Francisco-based chip maker.

Transmeta's Crusoe microprocessors are designed for performance at low power, prolonging battery life in mobile computers. The chips are x86 processor-compatible, which allows them to accept applications designed for Intel Corp. processors. Earlier this month, IBM backed out of tentative plans to use Transmeta's chips in its ThinkPad 240 notebooks.

User Skepticism Cited In Oracle Stock Dip

Analysts predict some are holding off on nascent 9i; users complain about pricing

BY DAN VERTON

Concerns about the pace of future sales of its business applications put a damper on Oracle Corp.'s stock last week, raising new questions about the company's transition to application services and the recent departure of former President Ray Lane.

Analysts blame the stock's mild volatility — it slipped 1 3/4 to close at 24 13/16 by last Wednesday — in part on concerns that users are taking a wait-and-see approach to the company's new business application suite.

Despite Oracle's recent release of its Oracle9i Application Server suite and its claims that it has saved $1 billion in expenses by using its own software, analysts acknowledge that the new software is still in its infancy and say some users may want to wait until all of the bugs are worked out before they install it.

'Wacky' Caching Features

"We have been on record since [Oracle9i Application Server] came out in June that it is a 1.0 product that won't be really done until sometime next year at the earliest and that in this version, it has some real flaws," said Mike Gilpin, an analyst at Giga Information Group Inc. in Cambridge, Mass. Among those problems are some "wacky" caching features, he said.

Oracle couldn't be reached for comment.

Doug Cummings, an Oracle user and manager of new technologies at Vicor Corp. in Andover, Mass., said the stock slip is likely the result of many things, including recent user dissatisfaction with the company's capacity-based pricing.

"Customer dissatisfaction at a bad pricing model and application issues and rumor are all affecting the stock price," said Cummings. "I think the trend will continue long after the rumors die."

Michael Karaman, vice president and chief technology officer for product development at The Medstat Group Inc. in Ann Arbor, Mich., said many high-tech stocks have been dropping in value during the past several weeks. Karaman added that although his clients will likely upgrade, many continue to complain about pricing. "To my knowledge, [Oracle has] not made any concessions to date," he said.

Carl Olofson, an analyst at International Data Corp. in Framingham, Mass., said Oracle application sales were very good during the quarter ended Aug. 31, but users may be reluctant to convert to the new applications because they are packaged differently from the prior versions.

Carl Zetie, another analyst at Giga, said it isn't clear whether the conservative sales forecast is due to concerns about the application server or the individual applications. "If the latter, it is certainly true that there is unhappiness among [application] users both over product ... and over relations with Oracle," he said.

"The only surprise is how long it has taken most people [in] the market to realize just how much Oracle misses Ray Lane," Zetie said. ◗

Mildly Volatile

Oracle stock on Nov. 9:

HIGH	LOW
26 7/8	24 1/16
52-WEEK HIGH	**52-WEEK LOW**
46 15/32	11 31/32

Continued from page 1

Oxford

Tuesday, she said. She declined to comment on Oxford's intention to farm out other aspects of IT. CIO Art Gonzalez didn't return calls seeking more details by press time.

However, other sources said the plan also includes data center operations, network operations, telecommunications and server support. That would affect most of Oxford's 440 IT workers. Application development will likely remain in-house, though CSC is rumored to be in the running to provide help there.

Oxford would be one of the first major HMOs to outsource so extensively, which will likely spark similar deals in the next year, said Mark Anderson, an analyst at Meta Group Inc. in Stamford, Conn.

"[IT] is not the core competency of most insurers, and they're starting to realize that," Anderson said.

Oxford's IT group has been on a roller coaster since a difficult migration in 1996 to a new set of homegrown applications to manage membership and process claims. That software miscalculated payments, underestimated costs and overestimated income by $392 million. As a result, Oxford posted its first-ever quarterly loss — $78 million — in November 1997. The state of New York also fined the company $3 million for breaking insurance laws [News, Oct. 30].

Nixed Outsourcing at First

Oxford considered outsourcing at the time. But then-new senior managers who were hired to stabilize the HMO ultimately nixed the idea. They figured that Oxford's own IT staff knew best how to repair the applications.

But outsourcing now that major systems fixes are done and the company is back on track financially is "like a kick in the teeth," said a source in Oxford's IT department, who asked to remain anonymous.

During the turbulence after the new systems went live and malfunctioned, many IT people worked overtime — unasked and uncompensated, he said. The new outsourcing agreement has "been upsetting. There is nobody out there who is happy about this," he said.

All I Got Was a T-shirt

In a meeting Nov. 6 with the IT staff, senior executives said all IT people will be offered jobs under the CSC deal, but no offers have been made yet. IT staffers got T-shirts, mouse pads and employee handbooks from CSC.

El Segundo, Calif.-based CSC confirmed talks with Oxford but didn't give specifics. "There is no signed agreement yet," a spokesman said.

What has been particularly frustrating is the uncertainty during the past several months about whether internal IT staff would have jobs, another Oxford internal IT source said. And work on new projects was tabled during the evaluation.

"It's a pretty simple and classical case of the inability to manage and control IT," he said.

To help retain staff while exploring its options, Oxford promised bonuses to IT staffers potentially affected by a deal, payable 45 days after a decision was reached. However, some viewed the gesture as too little. As one in-the-trenches IT veteran put it, "They all seem to think that people are fat, dumb and happy, but we're not." ◗

The Oxford Chronicles

The HMO has seen many IT ups and downs:

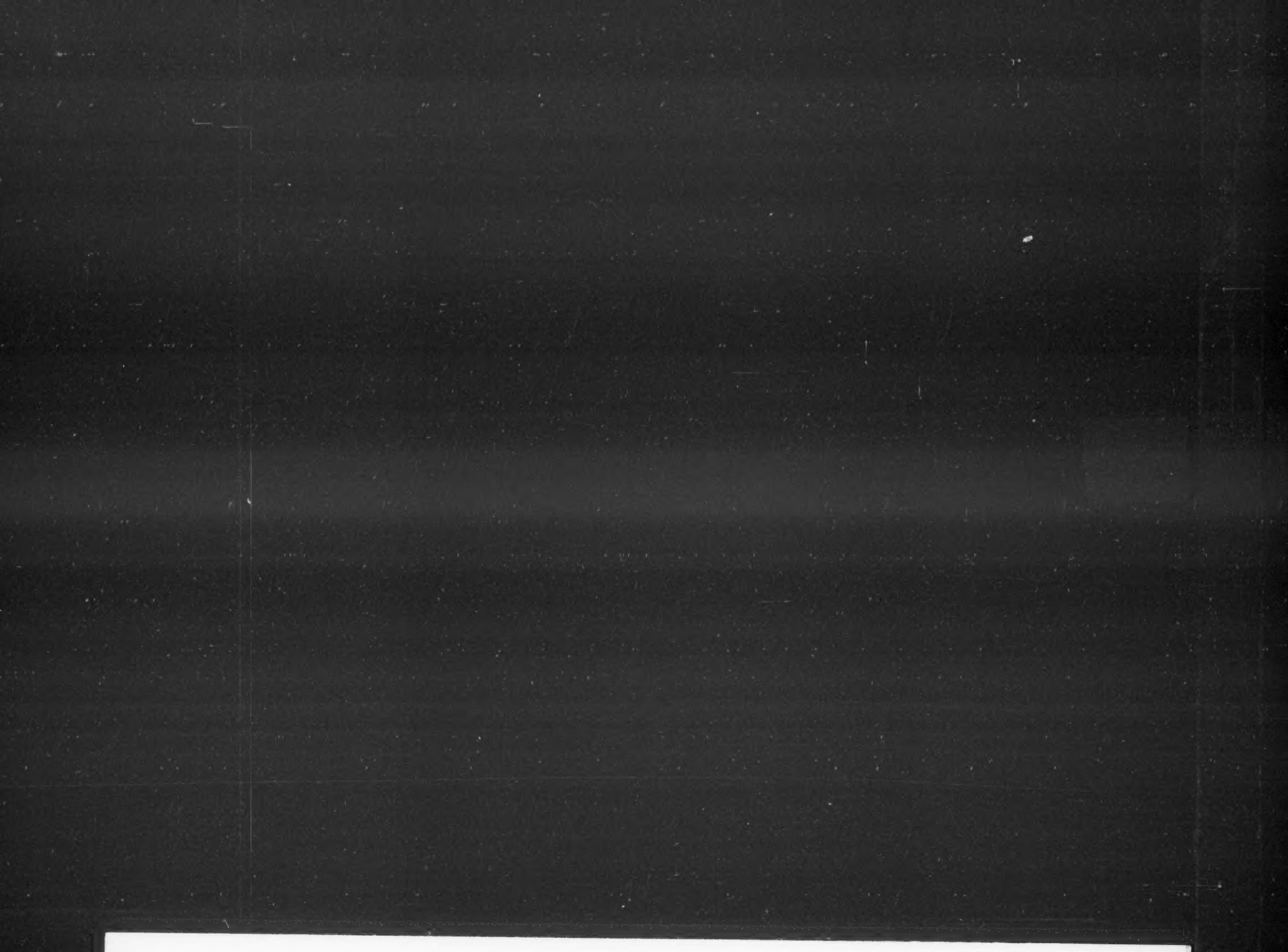
LATE 1996 Oxford rolls out new claims processing and membership management applications, kicking off a string of costly billing and claims errors

NOVEMBER 1997 Oxford announces its first-ever quarterly loss: $78M

MID-1999 Major systems fixes are done. Claims backlog cut from 1.5M to 400,000

APRIL 2000 Oxford managers announce they will study whether and how much to outsource IT

NOV. 6, 2000 An estimated $270M to $330M deal with CSC is announced internally



BRIEFS

Luminant Worldwide Plans to Layoff 175

After failing to meet revenue expectations, Web consulting firm Luminant Worldwide Corp. in Dallas announced it will lay off 18% of its workforce, or about 175 employees, reducing the total number of workers to 775. The company said it was also restructuring its business to reach profitability. Luminant's revenue for the third quarter was $38 million, a decline of 5% from the second quarter.

Other Internet consulting firms, including Chicago-based Xpedior Inc., Atlanta-based iXL Enterprises and Boston-based Viant Corp., have also had lower-than-expected third-quarter earnings, due in part to the curtailed electronic-business spending by cash-strapped dot-coms.

IBM Announces WebSphere for Linux

IBM last week announced a version of its WebSphere e-commerce software application to run on the Linux operating system. IBM said the new Linux version of the software will be available from the four major distributors of Linux: Caldera Systems Inc., Red Hat Inc., SuSE AG and TurboLinux Inc.

Transmeta IPO Comes Amid Chip Evaluation

Microprocessor designer Transmeta Corp. launched its highly anticipated 13 million-share initial public offering (IPO) on the Nasdaq Stock Market last week, with shares closing at twice the initial price. But questions about the performance of Transmeta's low-power Crusoe chip – and hesitation on the part of some big U.S.-based computer makers to use the chip – continue to haunt the San Francisco-based chip maker.

Transmeta's Crusoe microprocessors are designed for performance at low power, prolonging battery life in mobile computers. The chips are x86 processor-compatible, which allows them to accept applications designed for Intel Corp. processors. Earlier this month, IBM backed out of tentative plans to use Transmeta's chips in its ThinkPad 240 notebooks.

User Skepticism Cited In Oracle Stock Dip

Analysts predict some are holding off on nascent 9i; users complain about pricing

BY DAN VERTON

CONCERNS about the pace of future sales of its business applications put a damper on Oracle Corp.'s stock last week, raising new questions about the company's transition to application services and the recent departure of former President Ray Lane.

Analysts blame the stock's mild volatility — it slipped 1 3/4 to close at 24 13/16 by last Wednesday — in part on concerns that users are taking a wait-and-see approach to the company's new business application suite.

Despite Oracle's recent release of its Oracle9i Application Server suite and its claims that it has saved $1 billion in expenses by using its own software, analysts acknowledge that the new software is still in its infancy and say some users may want to wait until all of the bugs are worked out before they install it.

'Wacky' Caching Features

"We have been on record since [Oracle9i Application Server] came out in June that it is a 1.0 product that won't be really done until sometime next year at the earliest and that in this version, it has some real flaws," said Mike Gilpin, an analyst at Giga Information Group Inc. in Cambridge, Mass. Among those problems are some "wacky" caching features, he said.

Oracle couldn't be reached for comment.

Doug Cummings, an Oracle user and manager of new technologies at Vicor Corp. in Andover, Mass., said the stock slip is likely the result of many things, including recent user dissatisfaction with the company's capacity-based pricing.

"Customer dissatisfaction at a bad pricing model and application issues and rumor are all affecting the stock price," said Cummings. "I think the trend will continue long after the rumors die."

Michael Karaman, vice president and chief technology officer for product development at The Medstat Group Inc. in Ann Arbor, Mich., said many high-tech stocks have been dropping in value during the past several weeks. Karaman added that although his clients will likely upgrade, many continue to complain about pricing. "To my knowledge, [Oracle has] not made any concessions to date," he said.

Carl Olofson, an analyst at International Data Corp. in Framingham, Mass., said Oracle application sales were very good during the quarter ended Aug. 31, but users may be reluctant to convert to the new applications because they are packaged differently from the prior versions.

Carl Zetie, another analyst at Giga, said it isn't clear whether the conservative sales forecast is due to concerns about the application server or the individual applications. "If the latter, it is certainly true that there is unhappiness among [application] users both over product ... and over relations with Oracle," he said.

"The only surprise is how long it has taken most people [in] the market to realize just how much Oracle misses Ray Lane," Zetie said.

Mildly Volatile

Oracle stock on Nov. 9:

HIGH	LOW
26 7/8	24 1/16
52-WEEK HIGH	**52-WEEK LOW**
46 15/32	11 31/32

Continued from page 1

Oxford

Tuesday, she said. She declined to comment on Oxford's intention to farm out other aspects of IT. CIO Art Gonzalez didn't return calls seeking more details by press time.

However, other sources said the plan also includes data center operations, network operations, telecommunications and server support. That would affect most of Oxford's 440 IT workers. Application development will likely remain in-house, though CSC is rumored to be in the running to provide help there.

Oxford would be one of the first major HMOs to outsource so extensively, which will likely spark similar deals in the next year, said Mark Anderson, an analyst at Meta Group Inc. in Stamford, Conn.

"[IT] is not the core competency of most insurers, and they're starting to realize that," Anderson said.

Oxford's IT group has been on a roller coaster since a difficult migration in 1996 to a new set of homegrown applications to manage membership and process claims. That software miscalculated payments, underestimated costs and overestimated income by $392 million. As a result, Oxford posted its first-ever quarterly loss — $78 million — in November 1997. The state of New York also fined the company $3 million for breaking insurance laws [News, Oct. 30].

Nixed Outsourcing at First

Oxford considered outsourcing at the time. But then-new senior managers who were hired to stabilize the HMO ultimately nixed the idea. They figured that Oxford's own IT staff knew best how to repair the applications.

But outsourcing now that major systems fixes are done and the company is back on track financially is "like a kick in the teeth," said a source in Oxford's IT department, who asked to remain anonymous.

During the turbulence after the new systems went live and malfunctioned, many IT people worked overtime — unasked and uncompensated, he said. The new outsourcing agreement has "been upsetting. There is nobody out there who is happy about this," he said.

All I Got Was a T-shirt

In a meeting Nov. 6 with the IT staff, senior executives said all IT people will be offered jobs under the CSC deal, but no offers have been made yet. IT staffers got T-shirts, mouse pads and employee handbooks from CSC.

El Segundo, Calif.-based CSC confirmed talks with Oxford but didn't give specifics. "There is no signed agreement yet," a spokesman said.

What has been particularly frustrating is the uncertainty during the past several months about whether internal IT staff would have jobs, another Oxford internal IT source said. And work on new projects was tabled during the evaluation.

"It's a pretty simple and classical case of the inability to manage and control IT," he said.

To help retain staff while exploring its options, Oxford promised bonuses to IT staffers potentially affected by a deal, payable 45 days after a decision was reached. However, some viewed the gesture as too little. As one in-the-trenches IT veteran put it, "They all seem to think that people are fat, dumb and happy, but we're not."

The Oxford Chronicles

The HMO has seen many IT ups and downs:

LATE 1996 Oxford rolls out new claims processing and membership management applications, kicking off a string of costly billing and claims errors

NOVEMBER 1997 Oxford announces its first-ever quarterly loss: $78M

MID-1999 Major systems fixes are done. Claims backlog cut from 1.5M to 400,000

APRIL 2000 Oxford managers announce they will study whether and how much to outsource IT

NOV. 6, 2000 An estimated $270M to $330M deal with CSC is announced internally

Never before has 8U made such an impact on network availability

APC's NEW Symmetra® RM; the first N+1 rack-mountable Power Array™ with all the reliability of Symmetra's patented redundancy and scalability.

To ensure the highest availability for your business, you rely on a network built on redundant, scalable and "always on" servers, routers, switches and storage. Shouldn't your power protection strategy be just as redundant, reliable and scalable?

APC introduces Symmetra RM, the first rack-mountable Power Array with N+1 redundancy. Symmetra RM fits into a standard 19" rack, is scalable up to 6kVA of power capacity and has an integrated Web/SNMP Management Card for remote monitoring over the network.

Symmetra RM is compatible with APC's multiple management accessories, like the MasterSwitch™ family for remote rebooting or the Environmental Monitoring Card for temperature and humidity monitoring.

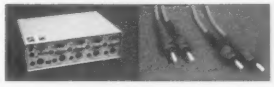
Increase the redundancy of your network with Symmetra RM today. Contact APC and let APC's Legendary Reliability™ work for you.

Cisco Management Connection · Tivoli · Solaris Compatible · Designed for Microsoft Windows 2000 Professional · HP OpenView Premier Partner

The Symmetra RM fits into any standard 19" enclosure and takes only 8U of space. Its power modules are hot-swappable, so you can scale them up without any downtime. Symmetra RM is also easily manageable with the industry-leading network platforms.

APC was chosen by PC Magazine *as one of the "Top 100 Technology Companies That Are Changing The World" (10/99).*

NEW! APC is your one-stop shop for connectivity solutions: KVM switches, fiber optic cables, USB, FireWire and many more.



Symmetra Rack-mount Features:

- Rack-mountability which saves floor space.
- N+1 Redundancy in just 8U of rack space.
- User-replaceable and hot-swappable modules that eliminate downtime.
- Integrated Web/SNMP management.
- Scalable power and runtime with additional 2 kVA modules which can be added up to 6 kVA of power capacity (with an extra module for redundancy).
- User-friendly LCD & LED display for local control and management.
- Safe shutdown for any Network OS.

APC
Legendary Reliability™

Visit APC at Comdex Fall booth #L5519

APCC A Nasdaq-100 Company

Enter to WIN A FREE Symmetra Rack-mount from APC!

All entrants will receive a FREE Enterprise Availability Kit.

To order: Visit *http://promo.apcc.com* Key Code w346z • Call 888-289-APCC x1694 • Fax 401-788-2797

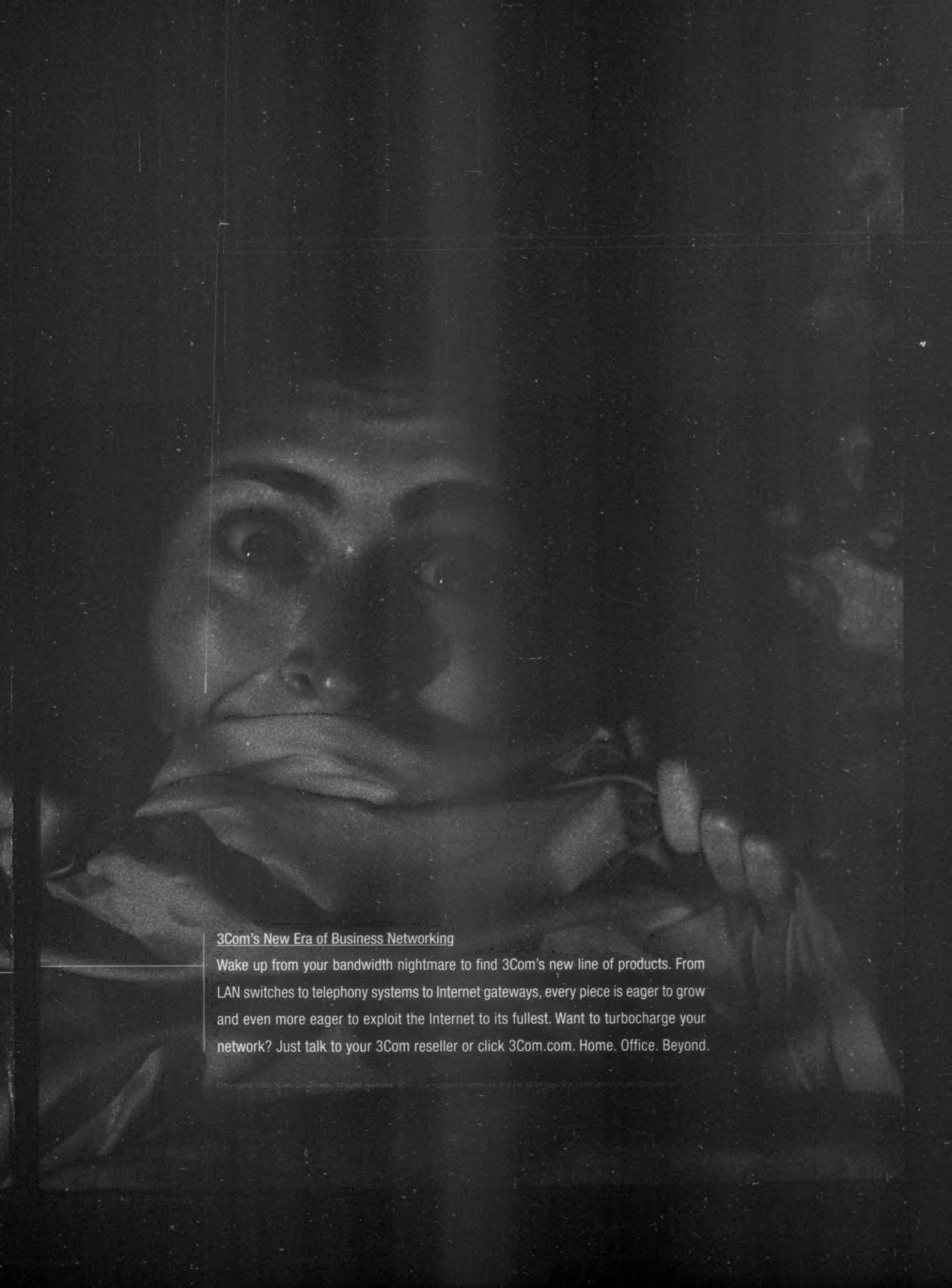
©2000 American Power Conversion. All Trademarks are the property of their owners. SY2AØEF-US • PowerFax: (800) 347-FAXX • E-mail: apcinfo@apcc.com • 132 Fairgrounds Road, West Kingston, RI 02892 USA
Microsoft, Windows, are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Screenshots reprinted by permission from Microsoft Corporation.

You're having a recurring dream that your network is chasing you.

Simpler Networking, anyone?

3com

Simple sets you free.


3Com's New Era of Business Networking
Wake up from your bandwidth nightmare to find 3Com's new line of products. From LAN switches to telephony systems to Internet gateways, every piece is eager to grow and even more eager to exploit the Internet to its fullest. Want to turbocharge your network? Just talk to your 3Com reseller or click 3Com.com. Home. Office. Beyond.

ADP Upgrade Glitch Causes Online Trading Problems

Customers unable to receive confirmation of trades; analysts call incident 'a fluke'

BY TODD R. WEISS

Problems with a routine upgrade of mainframe software at Automatic Data Processing Inc. (ADP) caused a system crash on Nov. 3 that temporarily left customers of at least five brokerages unable to get real-time updates of key information such as the cost of the online stock trades they were making.

Officials at Roseland, N.J.-based ADP, which claims its brokerage services business processes 25% of the online stock trades in North America, last week confirmed that technical problems with one of the company's computers disrupted the transaction-matching system it uses to track incoming buy and sell orders.

Two New York-based brokerages, Quick & Reilly Inc. and TD Waterhouse Group Inc., said they were affected by the system crash. ADP spokeswoman Arlene Driscoll said five brokerage firms took the company up on its offer to help update trading records during the weekend of Nov. 4.

However, Driscoll refused to specify the number of financial services firms that were affected by the problems or even to say how many brokerage clients ADP has. She also declined to release specific details about the cause of the system crash, beyond saying that it occurred while workers at ADP were installing a "mainframe-based software upgrade."

ADP immediately contacted its clients about the problem and repaired the so-called order-match system after the stock markets closed on Nov. 3, Driscoll said. The company then offered to help all affected clients update their records, she said.

ADP didn't disclose the names of the five brokerages that asked for assistance.

Glitches Happen

Customers of the brokerages were still able to make trades while the transaction-matching system was down, but they couldn't receive immediate confirmation of the cost of their trades. Quick & Reilly said its customers were also unable to get confirmation that their trades were being made, forcing the company to manually issue notices to that effect.

Larry Tabb, an analyst at TowerGroup in Needham, Mass., called the incident "a fluke" and said he hadn't heard of many similar technical problems at ADP.

"ADP has a pretty good track record," Tabb said. Such glitches are typical during upgrades, he added, because complete testing and performance modeling is "virtually impossible" because of the massive amounts of information involved.

Rob Sterling, an analyst at Jupiter Communications Inc. in New York, said he agreed. "Technical glitches do happen," Sterling said. ◗

Is It a Fluke?

A routine upgrade of mainframe software caused headaches for online traders working with brokerages that use ADP for back-office transaction processing:

- At least five brokerage houses were affected when an ADP order-matching system wouldn't allow online stock-trade customers to confirm trade prices and, in some cases, to receive confirmation of transactions.
- The failure began on the morning of Nov. 3 and continued until after the close of the stock markets that day, forcing ADP to divert trade traffic to a backup system.
- ADP wouldn't release information on the number of brokerages or individual customers affected.

Coke's Net Links 87 Countries

Equant crafts global internetwork design

BY JAMES COPE

The Coca-Cola Co. last week confirmed that it had completed the design of a new network that will link its 289 facilities in 87 countries.

Equant NV in Amsterdam created the soft-drink company's internetworking plan, said Claude Marais, strategic relations manager at Atlanta-based Coca-Cola. Eventually, all of the company's site-to-site network traffic will run over Equant's global frame-relay backbone, and the network will be managed by the vendor as well, Marais said. The total cost of the project is expected to be $47 million over the next five years, he added.

The decision to create a new internetwork came about in large part from Coca-Cola's ongoing deployment of enterprise resource planning software from Munich, Germany-based SAP AG, Marais said.

According to Jim Slaby, an analyst at Giga Information Group Inc. in Cambridge, Mass., SAP deployments require a consistently robust network because of "some definite latency tendencies."

Marais said Coca-Cola had been working with several service providers but decided to move to a single outsourcer that could build, manage and guarantee quality of service on a single network. But Marais was unable to identify the current providers, and he declined to discuss details of the service-level agreement that Coca-Cola has with Equant.

COCA-COLA'S $47 million global network will link 289 plants

"As your applications and organization grow, you outgrow your network," he said. "We ... liked [Equant's] capability to manage holistically around the world."

Marais said he also likes that "100% of the backbone is owned and operated by Equant." Most other carriers have several sets of alliances that collectively provide all of the optical links, he explained.

Slaby said no other backbone provider has a more extensive global infrastructure than Equant. The company's movement toward tiered IP services, which speed network throughput by classifying and prioritizing traffic according to its urgency, was likely a factor in Coca-Cola's decision to have Equant manage the network.

Marais said Equant is expected to create the network backbone during the next four months. ◗

Office Depot To Revamp Call Centers

BY MARC L. SONGINI

Facing a dismal fourth quarter, Office Depot Inc. is moving to consolidate and improve its call centers — an initiative that's slated to include a $22 million investment in new technology.

The office products supplier last week announced that the sales performance of its North American retail division "continued to trend downward." Office Depot CEO Bruce Nelson said the company will also consolidate 24 call centers into seven and upgrade its customer service organization. But an Office Depot spokeswoman said the two announcements aren't related.

CRM Overhaul Also Planned

Nelson blamed Office Depot's poor performance on weak sales of desktops and other computer-related equipment, as well as on higher warehouse costs.

The Delray Beach, Fla.-based company also plans a $28 million retooling of its customer relationship management infrastructure, Nelson said. Office Depot will invest $22 million in a computer telephony system that it said will improve call center efficiency without raising the cost of operations.

The revamp will be built around application modules from Methuen, Mass.-based Genesys Software Systems Inc., according to Office Depot officials. Munich, Germany-based Siemens AG's Information and Communications Networks will handle the systems integration work involved in the project.

When completed, the system will combine telephone, e-mail and Web site data into one centrally accessible call center. Currently, Office Depot's users can get service through several call centers built on a mixed IBM AS/400 and mainframe environment.

The existing browser-based user interface will be retained to access customer data, said Ken Jackowitz, vice president of business systems at Office Depot. The company also plans to use a cobrowsing capability that will allow personnel to take over a Web customer's session and direct him to appropriate locations on the Office Depot Web site for assistance.

The migration is scheduled to start in March and is due to be completed in August. ◗

If it's part of a focused strategy, your people embrace it,
your customers buy it and your technology supports it...
One idea can take you where you want to go.
From innovation to execution, our people deliver.

CAP GEMINI ERNST & YOUNG

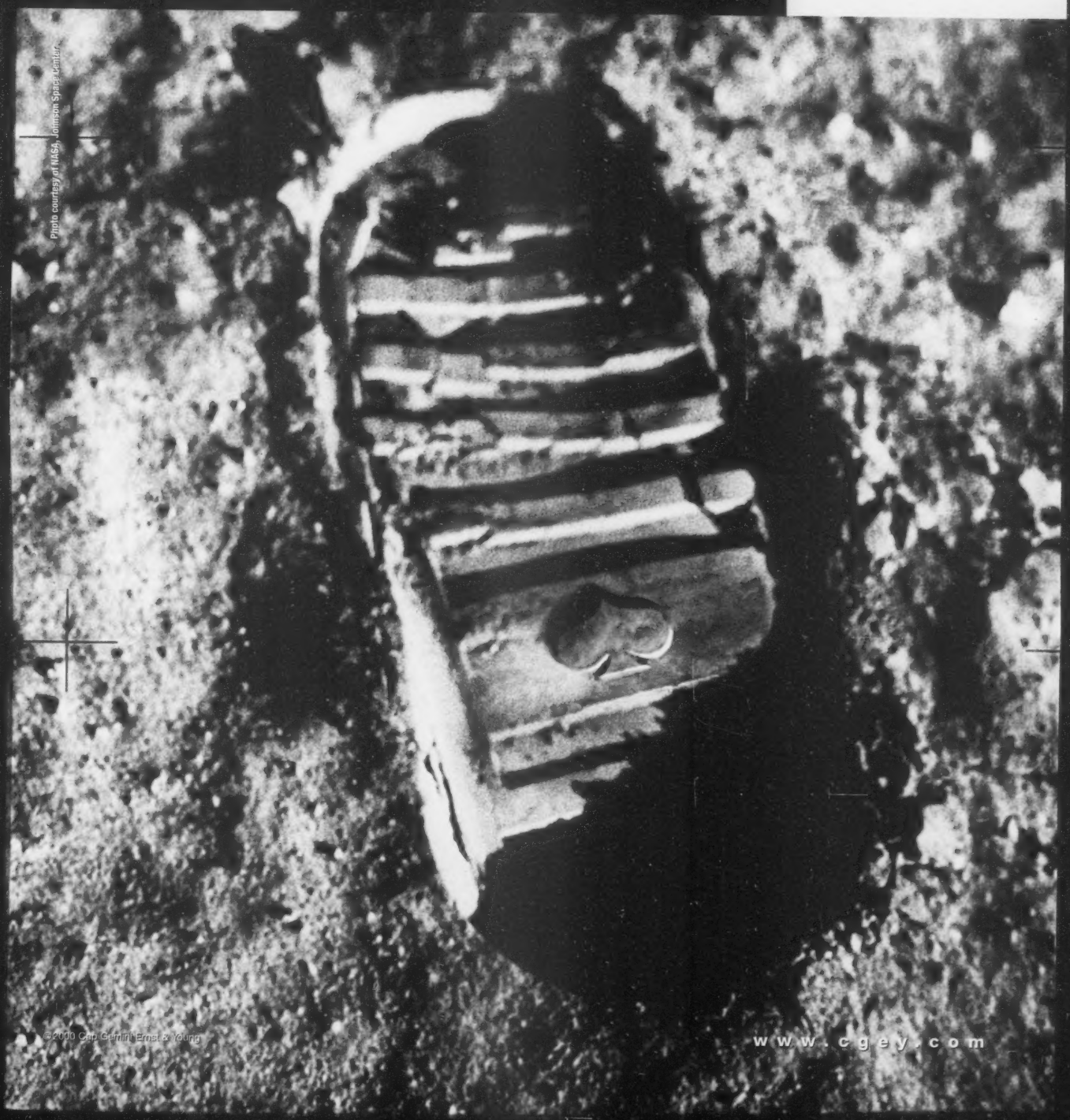


Photo courtesy of NASA, Johnson Space Center

©2000 Cap Gemini Ernst & Young

www.cgey.com

Presenting The Indu Desktop Manag

Web Management™

Backup/Disaster Recovery

Database Management

Monitoring

SERVER MANAGEMENT

Application Management

Network Management

Centralized Security Management

Single Sign-On™

Integrated Encryption

Firewall With Authentication

Virus Protection

SECURITY MANAGEMENT

Centralized User Administration

Malicious Web Content Detection

EnterpriseDiscovery™

Event Management/Correlation

Problem Management

Business Process Views™

ENTERPRISE MANAGEMENT

Predictive Management

Real World Interface™

Performance Management

Workload Management

OS/2

UNIX

Windows 98, 95, 3.1, CE

Windows NT

NetWare

EXTENSIVE PLATFORM COVERAGE

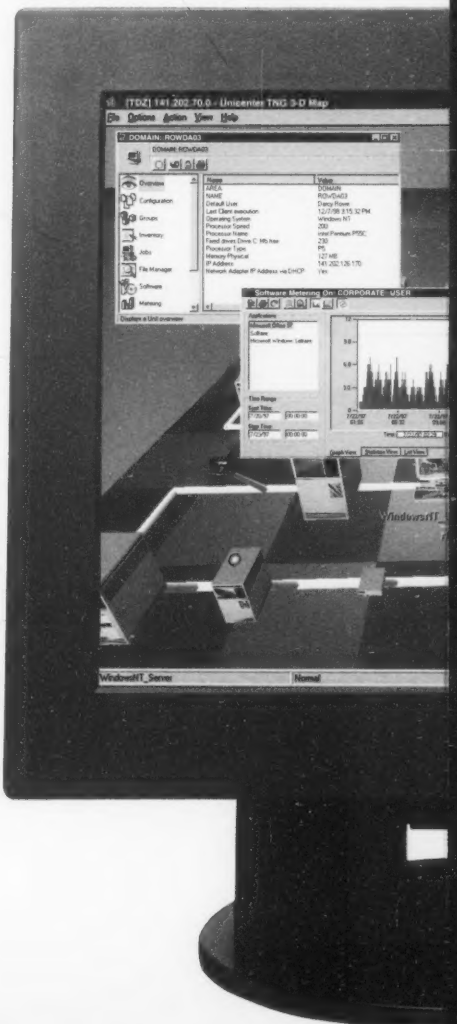
OS/390

OpenVMS

LANs, WANs, and Internet

TCP/IP, IPX, DECnet, SNA

AS400



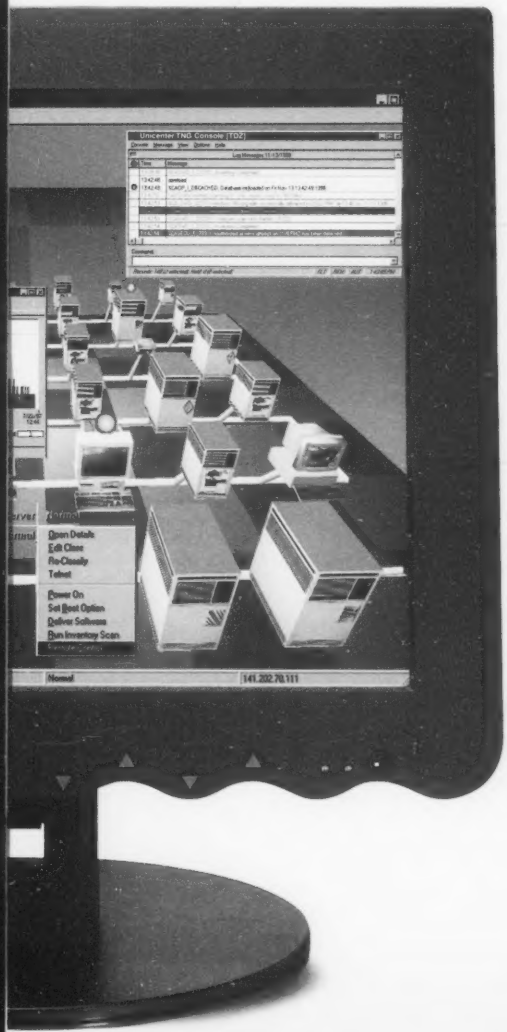
COMPUTER® ASSOCIATES

Software superior by design.

©1999 Computer Associates International, Inc., Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

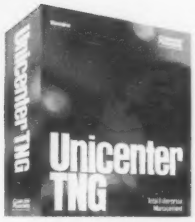
stry's Only Complete ement Solution.

Session Recording
Multi-Processor Support
Stealth Viewing
Roving Call-Back
Multi-Host Viewing
File-Transfer With Crash Recovery
Remote Access
REMOTE CONTROL
Integrated NT Security
Remote Reboot



Software Metering/Auditing
Software Maintenance
Software Inventory
Y2K Compliance Check
ASSET MANAGEMENT
Hardware Inventory
Configuration Management
Financial Tracking
Policy-Based Management
Historic Analysis

Roaming Users Support
Hands-Free OS Installation
Broadcasting
SOFTWARE DISTRIBUTION
Event Monitoring And Automation
Secure Data Transport System
Dynamic Groups
Push/Pull
N-Tiered Distribution



Yes, all of these features and functions can be found in one solution: And you can find out more by making one phone call. Call today and find out how the industry standard for network and systems management can help you get all of your desktops under control.

For more information, call 1-888-UNICENTER, or visit www.cai.com/ads/desktopmgmt

Unicenter TNG®

Instant Messaging Use Expected to Jump

Corporate penetration to skyrocket from 7% to 70% this year, IDC says

BY JENNIFER DiSABATINO

ANALYSTS and vendors have been promoting instant messaging (IM) and real-time collaboration as powerful tools for a couple of years, but corporations haven't raced to adopt them. Yet one research firm expects that usage to quadruple during the next year in light of the fact that more e-mail products have embedded the technology and that some employees are using free Web-based software on their own.

An International Data Corp. (IDC) study conducted earlier this year predicts that about 70% of large corporations will install IM software during the next 12 months (see chart). That represents a big leap over the 6.9% using it today, according to the study of 72 corporations with more than 1,000 employees.

"IM will carve out a functional niche in the corporate world, and it will grow at a strong rate," the report said.

In addition, it noted that IM will be much more popular in industries such as transportation and retail/wholesale, in which 99% of respondents said they were likely or extremely likely to use it. In contrast, 60% of government respondents said they aren't likely to use it.

A mixed picture emerged when information technology managers were queried about whether they use IM as a collaborative tool inside the corporation. In recent interviews, IT managers' reactions ranged from blank stares and surprise to enthusiastic affirmations that real-time collaboration is a mission-critical tool.

Ubiquitous for Some

Belinda Henry, messaging group administrator at Corning Cable Systems in Hickory, N.C., said teams of engineers use Sametime, a real-time collaboration software product with embedded messaging from Lotus Development Corp. The call centers use it for customer support.

Sametime has become so ubiquitous and such an effective tool that Corning Cable Systems needed to install machine translation software for its foreign workers, she said. That way, messages are translated automatically as they are sent around the globe.

"We have a lot of groups right now who are collaborating with German folks in our German sites, as well as using Spanish translation" for their sites in Puerto Rico, Henry said. The translation software is from Transparent Language Inc. in Merrimack, N.H.

Michael Rouse, corporate manager of customer relationship management at Toyota Motor Sales USA Inc. in Torrance, Calif., said his company will roll out IM in the next few months for customer service on the help desk and in sales sections of dealerships' sites. The software will automatically route messages to an available operator.

"We want to communicate with customers in the way that customers want to communicate with us," Rouse said, and if that means using IM, then he will get it for them.

Security, Privacy Concerns

Other users, however, have been much more cautious. IT managers at Credit Suisse First Boston Corp. in Zurich, R.R. Donnelley and Sons Co. in Downers Grove, Ill., and Emery Worldwide in Palo Alto, Calif., all said they don't use IM. Al Petras, director of IT at R.R. Donnelley, said there has been no demand.

Dean Richardson, a senior systems analyst at The Boeing Co. in Seattle, said his company is considering installing IM software but must first overcome fears about security and abuse of the service with too much personal chat.

"I think that the adoption rate overall is creeping up rapidly, but the sanctioned rate is [not]," said Dana Gardner, research director at Aberdeen Group Inc. in Boston.

Michele Rubenstein, chairwoman of the board of directors at the Electronic Messaging Association in Arlington, Va., agreed.

"The adoption rate is coming from the bottom up, as opposed to the top down," said Rubenstein, who is also a security strategist at TidePoint Corp. in Baltimore.

Analysts said there is actually little security risk in using IM. Even products that are publicly available, like America Online Inc.'s Instant Messenger (AIM) and Microsoft Corp.'s MSN IM, are as secure as any e-mail program, according to analysts.

Privacy is the real security concern, they said.

"Privacy has long been a thorn for IM," the IDC report said. "IM messages have been entirely Web-based, and potential corporate users have no control over message routing and no ability to define policies and secure standards for messaging delivery."

Stiff Competition

There are other hurdles. One is a lack of standards. AIM and MSN IM users can't chat with each other. AOL won't open its member lists to competing platforms for security reasons, the company says.

Microsoft, AT&T Corp. and a number of smaller companies that offer IM products have petitioned the Internet Engineering Task Force to endorse an open standard through the advocacy group IMUnified.

Smaller companies fighting for a foothold in the IM market include iCast Corp.; Tribal Voice, a subsidiary of CMGion Inc.; Jabber.com Inc., a subsidiary of Webb Interactive Services Inc.; and Bantu Inc.

In addition, the dominant corporate messaging and collaboration companies are adding IM capabilities to their packages. Besides Lotus' Sametime, IM is now available in Microsoft Exchange 2000.

Now that those are available, said David Ferris, director of research at Ferris Research Inc. in San Francisco, "it'll take off with a vengeance."

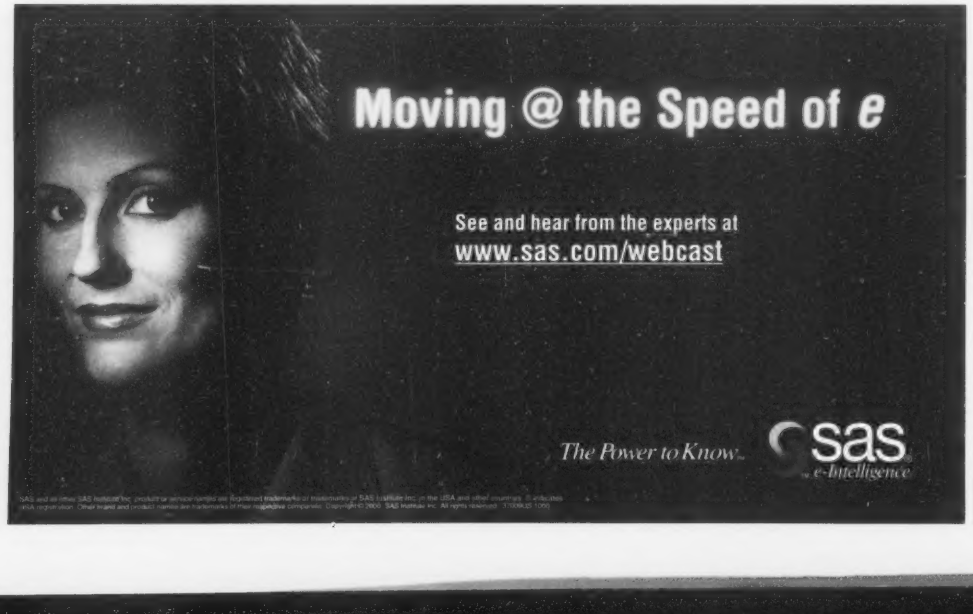
In an Instant

Instant messaging is more prevalent at larger companies, but installations will spike across the board within a year

■ MEDIUM-SIZE COMPANIES
■ LARGE COMPANIES

NUMBER OF EMPLOYEES	PERCENTAGE OF COMPANIES USING IM	PERCENTAGE LIKELY OR SOMEWHAT LIKELY TO DEPLOY WITHIN 12 MONTHS
100 to 999	2.9%	71.6%
1,000+	6.9%	70.8%

SOURCE: IDC, FRAMINGHAM, MASS.



"I don't know"

is probably not the answer you were looking for.

Considering all the things that can go wrong with your networks today, including their impact on users and business services and how much time you have to spot problems and fix them, not knowing what's up is a Bad Thing.

That's why we offer network and service management solutions that let you see far, wide, and deep into your networks, instantly, spotting root causes in real time—fixing them almost before they occur. That way, you'll never have to worry about not knowing what you need to know. You'll just know, you know?

Visual UpTime®

Visual Trinity™

Visual IP InSight™

Visual eWatcher™

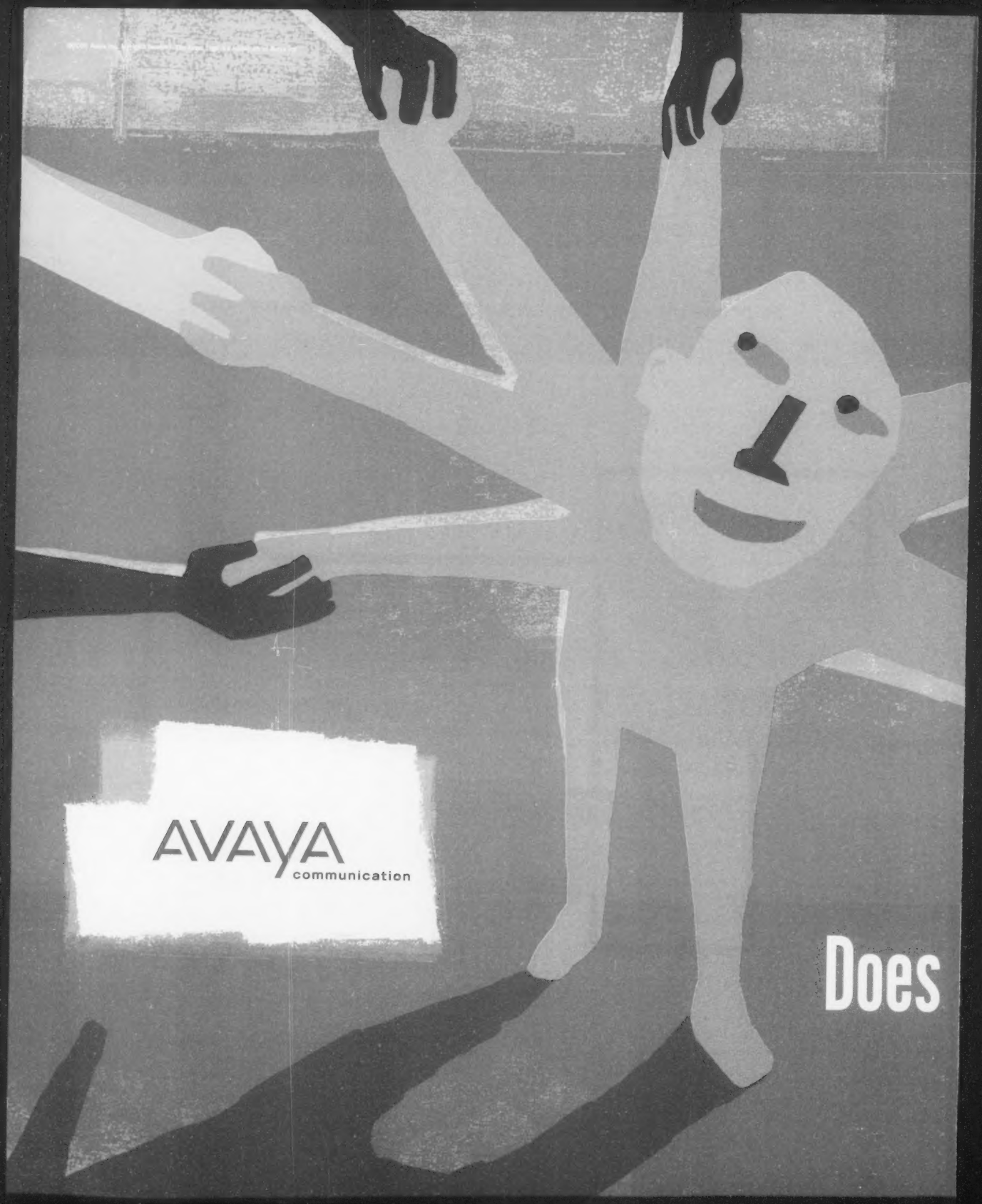
Visual Benchmark™

Get the answers you've always been looking for. Visit www.visualnetworks.com/cw for free demos of our solutions. Because the more you know, the less you don't know.

VISUAL NETWORKS®

www.visualnetworks.com/cw
1-800-240-4010
UK: +44 (0) 118 988 0242
ASIA/Pacific: 65-430 6786

©2000 Visual Networks Technologies, Inc. All rights reserved. Visual Networks and Visual UpTime are registered trademarks of, and Visual Trinity, Visual eWatcher and Visual Benchmark are trademarks of Visual Networks Technologies, Inc.


AVAYA
communication
Does

Communication without boundaries
Imagine a network that thinks.
That knows who's there. Understands your
company's relationship with each customer.
And sends them where they need to go.
Immediately. Automatically. No matter which wire
(or wireless) they came in on. Avaya solutions
don't just move communication around,
but treat it intelligently. Extracting, adding, and
using information about each contact. So you can
handle every customer like your best customer.
Visit avaya.com or call 866-GO-AVAYA.
your communication network
make the most of every contact?

Supercomputer Testing Standards Ready for Improvement

BY JENNIFER DISABATINO

The High-Performance Computing (HPC) User Forum is establishing supercomputer testing standards that it says will serve as a valuable tool for scientific, engineering and government users.

Addressing the SC2000 supercomputing conference in Dallas last week, officials from the HPC User Forum reported progress on a plan to create better performance tests for the most powerful class of computers. The forum represents leading supercomputer users.

Forum officials said improved tests are needed to advance scientific research, industrial engineering and classified government work, all of which rely heavily on supercomputers. The forum is organized by International Data Corp. (IDC) in Framingham, Mass.

Tests need to measure not only the speed of the processing and the amount of data processed, but also the agility that supercomputers demonstrate in processing data from variable sources, said Joyce Tompsett Becknell, director of the compute platforms and architectures group at Aberdeen Group Inc. in Boston.

Testing With Care

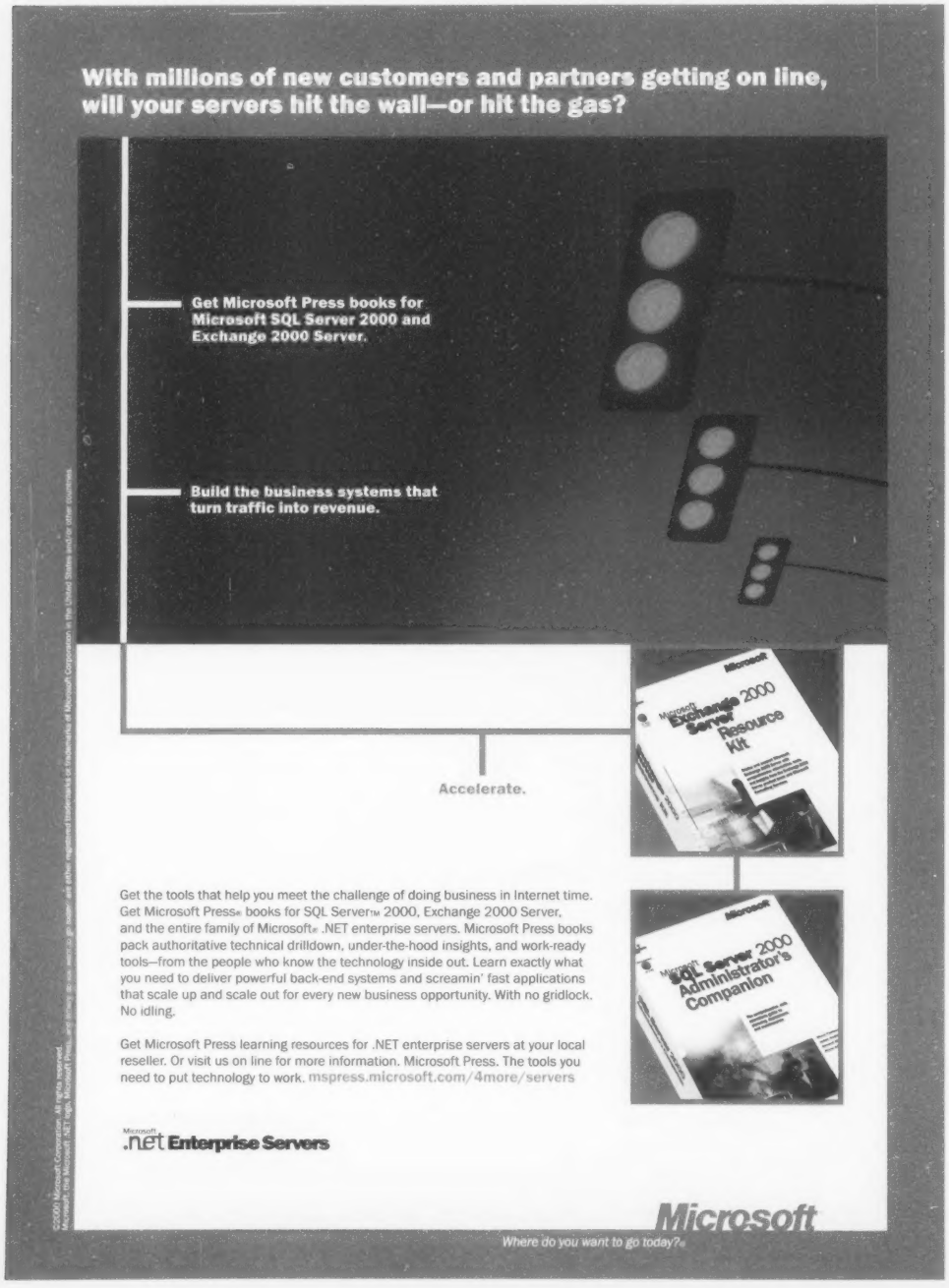
"Testing, in general, only demonstrates that you're very good at manipulating a test," Becknell said. "You have to be very careful what you get out of benchmarks."

For example, Becknell said, in last week's presidential election, the wait for results may have made Wall Street antsy, which in turn would have put a tremendous burden on the high-end systems processing transactions for financial institutions. Those requests come in from various points over the Internet at different times; traditionally, supercomputers have handled batch data from set points at set times, she said.

"If you look at what's going on with high-end computers, we're increasingly trying to use them in the Web universe," Becknell said. "It doesn't mean that [existing tests are] deceptive; they're better than nothing. At the same time, what users use computers for is not what they're tested for. Look for tests that do loads [similar to what] you're going to do."

Although existing testing mechanisms "are nearly meaningless beyond chest-thumping publicity, in the absence of anything better, they continue to be emphasized in many procurements," said Debra Goldfarb, IDC group vice president for worldwide systems and servers.

Robert Lucas, head of HPC research at the U.S. Department of Energy's National Energy Research Computing Center at the Lawrence Berkeley National Laboratory in Berkeley, Calif., is leading the team that's developing a new benchmark suite.



110 Air Freight Details and Invoice
111 Individual Insurance Policy and Client Information
112 Property Damage Report
120 Vehicle Shipping Order
121 Vehicle Service
124 Vehicle Damage
125 Multilevel Railcar Load Details
126 Vehicle Application Advice
127 Vehicle Buying Order
128 Dealer Information
129 Vehicle Carrier Rate Update
130 Student Educational Record (Transcript)
131 Student Educational Record (Transcript) Acknowledgment
135 Student Aid Origination Record
138 Education Testing Results Request and Report
139 Student Loan Guarantee Result
140 Product Registration

211 Motor Carrier Bill of Lading
212 Motor Carrier Delivery Trailer Manifest
213 Motor Carrier Shipment Status Inquiry
214 Transportation Carrier Shipment Status Message
215 Motor Carrier Pick-up Manifest
242 Data Status Tracking
244 Product Source Information
248 Account Assignment/Inquiry and Service/Status
249 Animal Toxicological Data
250 Purchase Order Shipment Management Document
251 Pricing Support
252 Insurance Producer Administration
255 Underwriting Information Services
256 Periodic Compensation
260 Application for Mortgage Insurance Benefits
261 Real Estate Information Request

General Order Status
353 Customs Events Advisory Details
354 U.S. Customs Automated Manifest Archive Status
355 U.S. Customs Acceptance Message
356 U.S. Customs Permit to Transfer Request
357 U.S. Customs In-Bond Information
358 Customs Consist Information
361 Carrier Interchange Agreement (Ocean)
362 Cargo Insurance Advice/Shipment
404 Rail Carrier Shipment Information
410 Rail Carrier Freight Details and Invoice
414 Rail Carrier Service Order
417 Rail Carrier Waybill Interchange
418 Rail Advance Interchange Consist
434 Rail Waybill Disposition Update Activity
435 Standard Transportation Commodity Code Description
436 Location Information
437 Railroad Junctions and

AUTHOR Authorization message
BALANC Balance message
BANSTA Banking status message
BAPLIE Bayplan/stowage plan occupied and empty locations message
BAPLTE Bayplan/stowage plan total numbers message
BMISRM Bulk marine inspection summary report message
BOPBNK boll
BOPCUS Balance of payments customer transaction report message
BOPDIR Direct balance of payment declaration message
BUPINF Balance of payments information from customer message
BUSCRD Business card report message
CALINF Vessel call information message
CASINT Request for legal administration action or information message

OVER 3000 BUSINESS DOCUMENTS TRANSLATED AND READY TO GO.

THE DIRECT APPROACH TO DIRECT MATERIALS.

141 Product Service Claim Response
142 Product Service Claim
143 Product Service Notification
144 Student Loan Transfer and Status Verification
146 Request for Student Educational Record (Transcript)
147 Response to Request for Student Educational Record (Transcript)
148 Report of Injury, Illness or Incident
149 Notice of Tax Adjustment or Assessment
150 Tax Rate Notification
151 Electronic Filing of Tax Return Data Acknowledgment
152 Statistical Government Information
153 Unemployment Insurance Tax Claim or Charge Information
154 Secured Interest Filing
155 Business Credit Report
157 Notice of Power of Attorney
159 Motion Picture Booking Confirmation
160 Transportation Automatic Equipment Identification
161 Train Sheet
163 Transportation Appointment Schedule Information
170 Revenue Receipts Statement
175 Court and Law Enforcement Notice
176 Court Submission
180 Return Merchandise Authorization and Notification
185 Royalty Regulatory Report
186 Insurance Underwriting Requirements Reporting
187 Premium Audit Request and Return
188 Educational Course Inventory
189 Application for Admission to Educational Institutions
190 Student Enrollment Verification
191 Student Loan Pre-Claims and Claims
194 Grant or Assistance Application
195 Federal Communications Commission (FCC) License Application
196 Contractor Cost Data Reporting
197 Real Estate Title Evidence
198 Loan Verification Information
199 Real Estate Settlement Information
200 Mortgage Credit Report
201 Residential Loan Application
202 Secondary Mortgage Market Loan Delivery
203 Secondary Mortgage Market Investor Report
204 Motor Carrier Load Tender
205 Mortgage Note
206 Real Estate Inspection
210 Motor Carrier Freight Details and Invoice

DON'T COMPROMISE YOUR DIRECT MATERIALS PROCUREMENT. WE'VE DONE THE WORK FOR YOU... LEVERAGE IT. www.xmls.com 1.877.965.9657

262 Real Estate Information Report
263 Residential Mortgage Insurance Application Response
264 Mortgage Loan Default Status
265 Real Estate Title Insurance Services Order
266 Mortgage or Property Record Change Notification
267 Individual Life, Annuity and Disability Application
268 Annuity Activity
270 Eligibility, Coverage or Benefit Inquiry
271 Eligibility, Coverage or Benefit Information
272 Property and Casualty Loss Notification
273 Insurance/Annuity Application Status
274 Healthcare Provider Information
275 Patient Information
276 Health Care Claim Status Request
277 Health Care Claim Status Notification
278 Health Care Services Review Information
280 Voter Registration Information
283 Tax or Fee Exemption Certification
284 Commercial Vehicle Safety Reports
285 Commercial Vehicle Safety and Credentials Information Exchange
286 Commercial Vehicle Credentials
288 Wage Determination
290 Cooperative Advertising Agreements
300 Reservation (Booking Request) (Ocean)
301 Confirmation (Ocean)
303 Booking Cancellation (Ocean)
304 Shipping Instructions
309 Customs Manifest
310 Freight Invoice (Ocean)
311 Canada Customs Information
312 Arrival Notice (Ocean)
313 Shipment Status Inquiry (Ocean)
315 Seal Numbers (Ocean)
317 Delivery/Pickup Order
319 Terminal Information
322 Terminal Operations and Intermodal Ramp Activity
323 Vessel Schedule and Itinerary (Ocean)
324 Vessel Stow Plan (Ocean)
325 Consolidation of Goods in Container
326 Consignment Summary List
350 Customs Status Information
352 DOT Customs Carrier

Interchanges Activity
440 Shipment Weights
451 Railroad Event Report
452 Railroad Problem Log Inquiry or Advice
453 Railroad Service Commitment Advice
455 Railroad Parameter Trace Registration
456 Railroad Equipment Inquiry or Advice
460 Railroad Price Distribution Request or Response
466 Rail Rate Reply
467 Rate Request
468 Rate Docket Journal Log
470 Railroad Clearance
475 Rail Route File Maintenance
485 Ratemaking Action
486 Rate Docket Expiration
490 Rate Group Definition
492 Miscellaneous Rates
494 Rail Scale Rates
500 Medical Event Reporting
501 Vendor Performance Review
503 Pricing History
504 Clauses and Provisions
511 Requisition
517 Material Obligation Validation
521 Income or Asset Offset
527 Material Due-In and Receipt
536 Logistics Reassignment
540 Notice of Employment Status
561 Contract Abstract
567 Contract Completion Status
568 Contract Payment Management Report
601 U.S. Customs Export Shipment Information
602 Transportation Services Tender
620 Excavation Communication
625 Well Information
650 Maintenance Service Order
715 Intermodal Group Loading Plan
805 Contract Pricing Proposal
806 Project Schedule Reporting
810 Invoice
811 Consolidated Service Invoice/Statement
812 Credit/Debit Adjustment
813 Electronic Filing of Tax Return Data
814 General Request, Response or Confirmation
815 Cryptographic Service Message

CASRES Legal administration response in civil proceedings message
CHACOA Chart of accounts message
CLASSI Classification information set message
CONTEN Contractual conditions message
COSTCO Commercial account summary message
CODARRI Container discharge/loading report message
CODECO Container gate-in/gate-out report message
CODENO Permit expiration/clearance ready notice message
CODEOR Container stock report message
COHAOR Container special handling order message
COLREQ Request for a documentary collection message
COMDIS Commercial dispute message
CONAPW Advice on pending works message
CONDPV Direct payment valuation message
CONDRA Drawing administration message
CONDRO Drawing organisation message
CONEST Establishment of contract message
CONITT Invitation to tender message
CONPVA Payment valuation message
CONQVA Quantity valuation message
CONRPW Response of pending works message
CONTEN Tender message
CONWQD Work item quantity determination message
COPARN Container announcement message
COPAYM Contributions for payment
COPINO Container pre-notification message
COPRAR Container discharge/loading order message
COREOR Container release order message
COSTCO Container stuffing/stripping confirmation message
COSTOR Container stuffing/stripping order message
CREADV Credit advice message
CREEXT Extended credit advice message
CREMUL Multiple credit advice message
CUSCAR Customs cargo report message
CUSDEC Customs declaration message

xmlsolutions

- 3000 business documents • 5 leading XML dialects
- 10 international languages

Get it. **www.xmls.com/directmaterials3**

BRIEFS

Cisco Beats Wall Street Projections

Cisco Systems Inc. beat Wall Street projections when it announced quarterly earnings last week. For its fiscal 2001 first quarter, which ended Oct. 28, the San Jose-based network equipment company reported $1.36 billion in net income, compared with $814 million for the same period a year ago. Revenue rose to $6.52 billion from $3.92 billion last year.

Sendmail, IBM Team For Linux Messaging

Emeryville, Calif.-based Sendmail Inc. and IBM announced that they will jointly develop, market and distribute Internet mail routing and hosting software that runs on IBM's Linux-enabled eServer family and software. The collaboration will ensure that e-mail moving from one platform, such as Lotus Notes, to another platform, such as Microsoft Exchange, doesn't overwhelm the server on the incoming side, said officials at both companies.

L&H Co-founders Quit

Lernout & Hauspie Speech Products NV (L&H) announced last week that co-founders Jo Lernout and Pol Hauspie have stepped down from their positions as co-chairmen and managing directors. The executive changes are "steps towards resolving recent controversies affecting the company and to maintain its leadership position in the emerging speech and language technology markets," said the Belgian speech-recognition software developer. The Securities and Exchange Commission is investigating L&H's business and accounting practices.

Short Takes

MICROSOFT CORP. announced a relationship with Hong Kong-based SMARTONE MOBILE COMMUNICATIONS LTD. to offer customers messaging and personal information that is available across multiple devices. . . . YAHOO INC. in Santa Clara, Calif., has agreed to acquire Taiwan's leading portal provider, KIMO.COM, in a stock-swap deal valued at $146 million.

Inprise to Change Its Name Back to Borland

Struggling vendor also acquires company to launch collaborative developer platform

BY LEE COPELAND

STRUGGLING tools vendor Inprise Corp. plans to return to its roots and change its name back to Borland.

After accumulating big losses in revenue and market share as Borland International Corp., the Scotts Valley, Calif., company switched its name to Inprise in 1998. But it was under the Inprise name that the company aborted a failed merger with Corel Corp. last May.

Inprise will assume its old name next quarter, officials said last week.

The company also announced an acquisition to jump-start its new developer service provider (DSP) business unit. The DSP group will develop a collaborative software development platform to link developers in disparate locations.

Inprise acquired Bedouin Inc., a Chicago-based development shop, in an all-stock deal. Terms weren't disclosed.

Analysts said providing Web-based access to Inprise's tools is welcome news, but they noted that the market for such services is small.

Inprise must "get the industry to see them as innovative and having the flair and resources to invest in new ideas," said Yasim Natis, an analyst at Gartner Group Inc. in Stamford, Conn. "Large IT departments are struggling with building applications with developers spread around the world . . . but it's a small group of people that have this problem," Natis added.

Using Bedouin's Web-based application development product, Inprise expects to launch the Borland DSP platform in January. The first release of the service will offer Web-based access to Inprise's Java, C++ and Delphi development environments as well as source-code management capabilities.

Using Borland DSP, a company could track the progress of an application development project outsourced to developers in India or coordinate a joint code-development project, said Ted Shelton, senior vice president of business development at Inprise.

Borland DSP will be available as a server and hosted offering. Pricing has yet to be determined.

Rikki Kirzner, an analyst at International Data Corp. in Framingham, Mass., said a number of tools vendors have recently sought partnerships or acquisitions to expand the Web-based collaborative capabilities of their tool sets (see box above).

"Most companies don't want to go to multiple vendors to buy the tools to design, create and mange code and content, which is essentially what has happened," said Kirzner.

AT A GLANCE

Online Developments

Software companies that have launched collaborative development environments:

LAST WEEK: Inprise and Bedouin software

LAST MONTH: Rational Software Corp. and Vignette Corp.

TWO MONTHS AGO: Merant PLC and Intel Online Services

Microsoft Aims to Connect Suppliers, B2B Marketplaces

BY CAROL SLIWA

Microsoft Corp. last week launched an E-Business Acceleration strategy designed to help suppliers connect to business-to-business marketplaces from four major vendors.

Many suppliers have been hesitant to link to electronic marketplaces for a variety of reasons, including fears that exchanges will provide a forum for buyers to comparison shop based solely on price.

Microsoft is trying to address the technology barriers with Supplier Accelerator software, which includes adapter code that will work with its existing products to connect to marketplaces powered by servers from Ariba Inc., Commerce One Inc., Clarus Corp. and VerticalNet Inc.

A supplier must be using Microsoft's BizTalk Server (which does business document routing, data transformation and tracking) plus its Commerce Server and SQL Server database in order to use Supplier Accelerator, which is due next quarter. Pricing information wasn't available.

"This is a step in the right direction, but it's no more than a step," said Andrew Bartels, an analyst at Cambridge, Mass.-based Giga Information Group Inc. "It probably is most meaningful for small companies, particularly small manufacturers and wholesalers, who have tended to be good customers for Microsoft because Microsoft's Commerce Server has been priced at a level for them."

Larger companies, however, tend to have more customized, Unix-based systems, and even midsize companies do some customization work, Bartels noted. "If they've already stabilized on the Microsoft platform, [Supplier Accelerator] will help," Bartels said. "If they haven't, it's probably not a compelling reason to move."

Small companies don't have many choices these days.

Mitch Kramer, an analyst at Boston-based Patricia Seybold Group, said IBM announced a similar product to help customers integrate to marketplaces created through Ariba and i2 Technologies Inc.

Microsoft went a step further than IBM, providing adapters to more vendors. But Microsoft's product doesn't provide adapters to marketplaces running on i2 and Oracle Corp., though a Microsoft spokesman said it does provide documentation for users to build their own links.

Faster Hookup

Microsoft's E-Business Acceleration initiative

What it is: An umbrella term for a set of products, services and partner programs to help companies connect to B2B marketplaces.

Key software: Supplier Accelerator, which includes adapter code to help suppliers link to marketplaces from Ariba, Commerce One, Clarus and VerticalNet. Using it requires Microsoft's BizTalk Server, Commerce Server and SQL Server.

When it's due: First quarter, 2001.

Changes Due For Lucent

BY JAMES COPE

Lucent Technologies Inc. last week said it is restructuring its top management in a push to integrate its sales and service organizations and may cut 240 jobs.

The announcement came amid rumors of even steeper layoffs and as the company began a search for someone to replace former Chairman and CEO Richard McGinn.

Among various shifts in responsibility, Lucent's executive vice president and chief financial officer, Deborah Hopkins, 45, will lead development of a new information systems infrastructure.

"Linking our finance organization and our CIO organization will better enable us to uniformly redesign our key processes and systems," said acting Lucent Chairman and CEO Henry Schacht.

Small Business:
Now get the lowest bill for voice and data.
Or get $100 of free long distance. Guaranteed.

Sprint integrates savings for your bottom line, exclusively for small businesses that spend $50 or more a month on voice and data.

Sprint wants to give you the lowest total long-distance voice and data bill you can pay. Lower than our national competitors.* Whether your business needs voice services, data services, or both, switch to Sprint today and start saving on your bottom line.

That includes virtually all the long-distance calls your small business makes: in-state, out-of-state, even international (like calls to Canada, the U.K., and all around the globe). Plus, you save on your domestic data services: frame relay and dedicated Internet access. And you get simplified billing from a single company.

The lowest long-distance voice & data bill. Or you'll get $100 of free long distance. Guaranteed.

If we can't lower your bill, we'll give you $100 of free long distance. Guaranteed. That's how confident we are that Sprint will deliver the highest quality service with the lowest possible bill for your small business.

So give us a call today. We'll review your current long-distance voice and data bill, and prove to you just how much of a difference we can make to your bottom line.

Let's make contact: Call 1 877 324-9036 ext 110
Visit www.sprintbiz.com/online_store/bottom_line9
Or contact your Sprint Authorized Sales Agent.

Sprint

The point of contact®

Copyright © Sprint 2000. All rights reserved. Restrictions apply. Excludes certain fees and taxes. Minimum monthly commitments will apply. $25,000 cap on total monthly service usage to be eligible. One time comparison only. Comparison will be made for equivalent services and terms. One $100 calling card per voice and one $100 calling card per data per Company invoice comparison. *Limited to certain national competitors (call for details). Limited-time offer. Promotion subject to change.

MARK HALL

Comdex addiction

THIS WEEK, I've joined a projected 220,000 other techno-junkies for our annual Comdex fix in Las Vegas. I am not proud of this addiction. I'd like to kick the habit. But there's no 12-step program to save me.

I had high hopes, so to speak, that the Web would rescue me and others from the craving to spend hours getting jostled along crammed aisles, eating wretched food, enduring the city's banal glitz and searching anxiously to find that one cool product that justifies it all.

MARK HALL is *Computerworld*'s West Coast editor. You can contact him at mark_hall@computerworld.com.

The Web was supposed to virtualize trade shows, especially monstrous ones like Comdex, making them quaint relics of the PC age. The promise of the Web was that I could use my laptop and point and click my way to product information and software demonstrations — even downloading a product and testing it without the cacophonous distractions inside the Las Vegas Convention Center.

The Web failed me. That's because judging technology and services without evaluating the people behind them is doing only half your due diligence. And Comdex is the one place in the U.S. where you can run almost any high-tech product through its paces while looking its developer or VP of sales in the eye when she tells you, "Oh, we'll fix that in the next release." Right. Where's that next booth?

So, here I am, looking for hot technology products and cool new trends that will change the way we work, play, maybe even think. That's what I've seen at some past Comdexes.

One positive new trend is in the way software gets distributed, as reporter Michael Meehan relates in this week's news pages. ASPs are here for good, if Comdex is an accurate barometer. This year, 70-plus companies will be demonstrating their services at the concurrent ASP Summit.

On the other hand, I've arrived in Las Vegas already downcast about wireless. I was expecting Bluetooth products to be drawing crowds to vendor booths. But Bob Brewin reports in this week's issue that that probably won't be the case. Seems the technology has hit some serious potholes on the road to deployment.

True technojunkies, however, are undaunted in the face of technology setbacks. We can always find something at Comdex to give us a rush. Something that we can get from our dealers once we get back home. In the meantime, I'll put off those Comdex withdrawal pains for another year. ◗

DON TENNANT

Is that Microsoft's final answer?

REGIS: STEVE BALLMER from Redmond, Wash., is the CEO of Microsoft. Behind him, cheering him on, is his Uncle Fester. Hi, Uncle Fester! OK, Steve, are you ready?

Ballmer: I'm ready, Regis! Let's do it!

Regis: Then let's play *Who Wants to Be Taken Seriously?* OK, Steve, here we go:

DON TENNANT is assistant news editor at *Computerworld*. Contact him at don_tennant@computerworld.com.

If your company bills itself as a provider of secure, reliable networking software, and your internal network suffers an embarrassing, potentially disastrous hacker attack, what do you do? **A.** Give confusing, conflicting accounts of the attack; **B.** Provide truthful, consistent information about it; **C.** Blame it all on Department of Justice intrusiveness; **D.** Ignore it all and talk really loudly about something else.

Ballmer: Well, let me see. My gut tells me the answer is D — that seems to be the most logical. But gee, I'm not sure. This is a tough one.

Regis: You know you have your three lifelines, Steve — 50/50, you can ask the audience or you can phone a friend.

Ballmer: I think I'll phone a friend, Regis. I'm going to call Bill. He's an old college buddy.

Regis: Well, let's get Bill on the line. Bill? This is Regis from *Who Wants to Be Taken Seriously?* Your friend Steve needs your help.

Bill: Finally!

Ballmer: Ha-ha! Bill, if your company bills itself as a provider of secure, reliable networking software, and your internal network suffers an embarrassing, potentially disastrous hacker attack, what do you do? **A.** Give confusing, conflicting accounts of the attack; **B.** Provide truthful, consistent information about it; **C.** Blame it all on Department of Justice intrusiveness; **D.** Ignore it all and talk really loudly about something else.

Bill: C, blame it on DOJ intrusiveness.

Ballmer: Are you sure, Bill? What if it happens to us and we need the FBI to help?

Bill: We have really smart people. We'd never have to ask . . . (Buzz!)

Regis: Oh, I'm sorry, Steve, time's up. Well, your friend seemed fairly certain. What do you think?

Ballmer: This is so hard, Regis! I'm going to have to ask the audience. I brought along the entire Microsoft public relations department, and they should know.

Regis: OK, audience, key in your answers now. (Pause.) Wow! That's the first time that's ever happened! Every single member of the audience

SPECIAL ADVERTISING SUPPLEMENT

White Paper

content technologies

MIMEsweeper

Executive Insights on Content Security:

Proactively Addressing Potential Liabilities in the New Economy

IDC
INTERNATIONAL DATA CORPORATION

COMPUTERWORLD
CUSTOM PUBLISHING

Executive Insights on Content Security:

Proactively Addressing Potential Liabilities in the New Economy

During the first half of this year, a number of high profile incidents were featured in the media which detailed malicious intruders sabotaging Web sites. Widely recognized names such as eBay, Amazon.com and E*Trade experienced significant downtime costing millions of dollars in lost revenue. Because of these incidents, security has become a major concern for every top-level executive whose business is increasingly dependent on e-commerce.

By Richard Dean, Program Manger, and Allan Carey, SeniorAnalyst, IDC

However, information security is not limited to e-commerce. It is also relevant to all Internet activities including e-mail and Web browsing. As more businesses provide Internet access to employees, content security and the potential liabilities surrounding unrestricted access are being discussed in executive boardrooms.

Issues Business Executives Face

Emerging technologies and the Internet are designed to allow businesses to be more productive and efficient. E-mail is the most widely used means of business communication, both internally and externally, because it is very intelligible and only requires a computer with a simple mail program and an Internet connection. The Internet has proven to be an evolutionary tool to gather competitive market information, prospect for sales leads, attract new customers, build stronger relationships with existing customers and suppliers and develop new distribution channels. These technologies also expose companies to an entirely new realm of liabilities and vulnerabilities.

In a recent study conducted by the American Management Association (AMA), 64% of employees, on average, have access to e-mail. E-mail penetration has saturated the enterprise market while opportunity for growth still exists in the small to medium sized business markets. With e-mail access literally at their fingertips, employees can correspond with friends and family aside from conducting their regular business activities. Of course, employees can also receive e-mail from any source through the Internet.

When an unsuspecting employee opens new e-mail, it can be like opening Pandora's box. For some hackers, e-mail is their transport vehicle of choice to hide worms, viruses and malicious mobile code (MMC). There have been numerous highly publicized cases including the "I Love You" bug, its mutant strain "Love Letter", and the infamous "Melissa" virus. By using a Trojan horse technique, hackers can gain access to the vital corporate infrastructure allowing vicious programs to wipe out hard drives, attach themselves to stored e-mail addresses and forward themselves to other unsuspecting recipients, and cause mission-critical data to be lost. The ramifications can be devastating. Estimates suggest that viruses alone have caused worldwide damage reaching $11 billion due to lost employee productivity, downtime and data loss.

According to the AMA report, 48% of employees have access to the Internet. Apart from conducting business activities on the Internet, employees have the freedom to browse their favorite Web sites, shop online and conduct personal financial transactions. These are the types of activities that can cause valuable and costly bandwidth to be consumed.

Other temptations of the Internet include pornographic sites, racially discriminatory sites and other pitfalls that can expose businesses to a multitude of legal liabilities. Underscored by the recent dismissal of dozens of Dow Chemical employees, companies are taking a no-tolerance posture involving the sending or storing of pornographic or violent e-mail materials within the workplace. Since July, Dow Chemical is reported to have terminated or disciplined nearly 300 employees for violating company policy regarding obscene e-mails. Prompted by an employee complaint, Dow narrowed its investigation by filtering keywords to locate potentially offensive materials, which were then further reviewed for violations.

Together, e-mail and the Internet can equal lost productivity, which in turn can quickly bring about a reduction in profitability (See chart). The $9,600 figure from the chart may not seem significant, but when multiplied by 1,000 employees, the result is $9.6 million lost in productivity. The total excludes all costs associated with providing Internet access.

Another issue employers must face is employer's rights vs. the employee's right to privacy. It has become a very fine line for the employer to walk. Due to global resource constraints, employees are spending an increasing number of hours at work, often leaving little time to accomplish duties required in their personal lives. Consequently, employees end up using company time and equipment, primarily e-mail, the Internet and a PC, to fulfill these personal duties. Does management consider this to be an acceptable or a fair trade-off between employees working more hours and employees using company assets for personal use? For many companies today, the privacy issue produces a pendulum effect swinging between an acceptable level of personal activity in the workplace to one side and a flagrant abuse of company assets to the other side.

Potential Losses Resulting from Declines in Employee Productivity

FACTORS	RESULT
Number of hours per day each employee spends on personal business	1
Number of work days per year	240
Average hourly rate including overhead expenses	$40
Annual cost of lost productivity per employee	$9,600

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS. 2000

This workplace dilemma also leads to the question of whether or not employers have the right to monitor employees' activities utilizing content security initiatives when these employees are using company assets. Do employees have the right to expect a certain level of privacy while on the job? There are valid arguments from both sides of this quandary. Employers believe they not only have the legal right, but the obligation, to monitor all activities within the confines of the physical surroundings as well as with company-owned assets. Today, the clash of both standpoints is being fiercely debated in many executive boardrooms, with employee rights groups and within certain legal circles.

In addition to privacy rights, businesses are confronted with the illicit siphoning of trade secrets. Proprietary infor-

mation remains a significant security concern for many CEOs. In 1998, for example, the Department of Commerce (DOC) reported that U.S. businesses incurred $12.5 billion in intellectual property losses.

Statistics indicate company insiders are often responsible for the majority of damage. These insiders can be current or former employees with motives such as revenge, self-promotion, notoriety or financial gain. If employees continue to have unlimited access to information without a comprehensive content security initiative in place, millions of dollars worth of intellectual capital could be trickling out of the business undetected.

It is critical, therefore, for business decision-makers to consider the drawbacks of monitoring employees' activities when evaluating whether or not to develop a content security initiative. The process is often time-consuming and labor-intensive. Dedicated human resources are needed to review all e-mails flagged for suspicious activity and to subsequently determine appropriate actions. Internet usage records require a similar review and evaluation process. This can be a costly endeavor to ensure a secure and productive ebusiness environment. The question becomes, which is the lesser of two evils? Investing to keep the environment secure? Or investing to replace what is lost or stolen from the environment?

Content Security

In order to ensure a secure and productive ebusiness environment, while protecting employee privacy, business decision-makers can implement a comprehensive content security policy imbedded in the early stages of business policy formulation. Content security picks up where anti-virus leaves off. It involves an Internet management tool utilized to control and manage e-mail scanning and monitoring, Web content and downloadable applications execution. The tool also offers customization functionality based on corporate policies. The content can be both active and passive. Examples of active content include viruses, Trojan horses, ActiveX, executables (.exe) and malicious mobile code. Passive content includes e-mail and excessive use of bandwidth. In addition to archiving, encryption and image scanning, the functions of content security are:

- **E-mail scanning and monitoring** – Checks all e-mail — inbound and outbound — for confidential data, excessive file size and proprietary material. Messages are scanned using keywords and phrases.
- **Web content** – Checks all Web activity by identifying and managing Web content containing racist or hate material, banned files, pornography, profanity and potentially lost or corrupted material.
- **Downloadable applications execution** – Checks all content for viruses, Java scripts, ActiveX and .exe. These can be attached to e-mails or hidden behind downloadable material from the Web.

A comprehensive content security initiative involves participation from the employer and the employees to ensure adoption and success of the program. The main components of a comprehensive program include the following elements:

- **Establish a content security policy** – A company policy that defines electronic usage for employees and warns them about acceptable business practices when using company assets and the repercussions for violating the policy. This policy covers all e-mail correspondence, Internet usage and appropriately sets employees' expectations of privacy. Employees are warned that monitoring takes place and each employee signs a consent form. A successful policy requires involving employees early in the process, gaining their buy-in and being flexible with expectations.
- **Education and training** – By educating employees and raising awareness of security issues, employees better understand the benefits of a content security program.
- **Content security solutions** – These solutions enable businesses to identify and manage content access over the Internet.

Ripped Off

Theft of intellectual property most frequently occurs through the following groups:

- **Insiders**
- **Intruders**
- **Hacktivists**
- **Criminals**
- **Industrial espionage**
- **Government-sponsored activity**

SOURCE: DEPARTMENT OF COMMERCE

Allan Carey is senior analyst and Richard Dean is program manager for Framingham, Mass.-based International Data Corp.'s Information Security Services research program. For more information on Content Security, see IDC's white paper, Content Security: Policy-Based Information Protection and Data Integrity.

Many vendors offer these solutions, including Content Technologies, Tumbleweed and Trend Micro.

■ **Maintenance and review** – As businesses change, company policies are updated to ensure business and network integrity in the ebusiness environment. Content security solutions are modified to address new threats and hazards.

Implementation of a comprehensive content security program will help ensure a secure ebusiness in an "always on" global economy. By taking the three e's — establish, educate and enforce — approach to content security, businesses gain a high degree of confidence, while fostering a harmonious and trusting work environment.

Risks of Disregarding Content Security

A plethora of issues can arise if a security program is not implemented. It can expose the company to an overwhelming number of legal and financial problems. Below are a few issues executives need to consider:

- Class and individual action suits
- Loss of network integrity and availability
- Loss of intellectual capital
- Loss of employee productivity
- Defamation of brand name and reputation

Class and individual legal action in the form of sexual harassment and hostile work environment, invasion of privacy and wrongful termination are examples of the most common legal liabilities. An illustrative case was Bouke vs. Nissan Motor Co. (1991). Two employees were terminated for having e-mail containing inappropriate language and jokes. The employees sued for invasion of privacy because the e-mails were obtained through monitoring. The judge ruled in favor of the defendant because Nissan required employees to sign a consent form explaining the company usage policy. The employees were aware that the company hardware and software were only intended for business use and that the company was monitoring information transfers.

Another example was New York State Correction Officers and Police Benevolent Association vs. State of New York Department of Corrections (2000). In this case, union members are suing the State of New York for exposing confidential information about the correction officers to inmates. The confidential information consisted of social security numbers, addresses and other personal information. The union is suing for an unspecified amount in damages. This is a provocative example of potential liability due to unsecured data.

When viruses, executables or malicious mobile code compromise network integrity and availability, mission-critical data can be lost or stolen without detection. One malicious attack can wreak havoc causing millions of dollars in lost revenue, not to mention the potential loss of intellectual capital. Reports estimate 97% of all ebusiness crimes go undetected or unreported. If a criminal breaks into a home, a homeowner would report the intrusion to the proper law enforcement authorities. Why wouldn't the same thought process apply to the business?

Businesses often refrain from divulging their vulnerabilities in order to prevent unwanted notoriety and additional attacks and businesses can't afford to blemish their reputation and brand name. It takes seven times more effort and money to attract new customers than it does to hold on to existing ones. In the ebusiness world, trust and loyalty are critical attributes to protect.

Breaches of security can become the catalyst for severe economic upheaval. Therefore, content security should be integral to the strategic business plan to safeguard against the potential legal and financial liabilities inherent with business activities conducted over e-mail and the Internet.

Adding to the argument, the return on investment (ROI) attributed to proactively implementing a content security plan is quantifiable from both an economic and human resource perspective. Essentially, businesses reap the monetary benefits of establishing a comprehensive program through increased employee productivity, improved network integrity and availability, stronger relations with partners and suppliers, and increased profit potential. In addition, businesses cultivate knowledgeable employees who are aware of and can guard against the trappings of the Internet.

Finally, senior executives also earn the respect, trust and loyalty of the workforce by establishing an environment of open communications. In such an environment, both employee and employer understand expectations and can work toward reducing potential liabilities and promoting the goals and objectives of the organization.

CASE STUDY: ZENITH ELECTRONICS CORP.

Content Technologies' MIMEsweeper Keeps E-mail Clean at Zenith

The hottest growth area in the field of Internet security is content security, with expected compound annual growth of 71% from 1999 to 2004, according to Framingham, Mass.-based research firm International Data Corporation (IDC). Content security revenues were only $66 million in 1999. In 2004, IDC expects that number to reach almost a billion.

The Critical Need

The reason for this fast growth: content security addresses a critical need in virtually every company connected to the Internet — a need that only recently was widely recognized. Viruses, pornography, oversized files or banned file types, spam and malicious Java code are innocently downloaded from a Web site — there are lots of dangers lurking out there in cyberspace — dangers that can bring down networks, spur harassment lawsuits, and degrade productivity of both people and systems.

Employees can unknowingly or deliberately send trade secrets to a competitor with the click of a mouse. Content security products protect companies from these dangers by scanning content and stopping suspect e-mail or Web downloads before they do damage.

Of course, some companies have been wise for years to the content dangers posed by the Internet. Zenith Electronics Corporation is a case in point. A developer and user of technology since its founding in 1918, the Glenview, Ill.-based company had 1999 sales of $834 million. Over four years ago, Zenith was one of the first companies to install Content Technologies' MIMEsweeper when it was first introduced.

Just think of the people who got hit hard with the Melissa virus, or any of the new ones that came out. We don't have to worry because MIMEsweeper catches new viruses even if we haven't updated the virus definitions.

-Jeff Ferrera, e-mail administrator, Zenith Electronics Corp.

MIMEsweeper scans all e-mails coming into or out of the organization through a dedicated Microsoft Windows NT box. Once through the gateway, e-mail is sent to the local network in Glenview or over leased lines to other locations. Any e-mail that violates policies set by Zenith is automatically blocked. Depending on the violation, the e-mail may be discarded, bounced back to the sender or held for further analysis by the IT staff.

"I can't remember the last time we had a virus in here. MIMEsweeper looks for things like Java script HTML viruses, Visual Basic stuff, .exe files — all the things that can attach to an e-mail. Usually, it can clean the e-mail for me — it will actually go in and blow up the attachment long enough to clean the virus, wrap the attachment back into the message, and send it on its way," says Jeff Ferrera, Zenith's e-mail administrator.

The Greatest Benefit

MIMEsweeper's greatest benefit is peace of mind.

"Just think of all the people who got hit hard with the Melissa virus," says Ferrera. "Or any of the new ones that have come out. We didn't have to worry because MIMEsweeper catches new viruses even if we haven't updated the virus definitions, which I probably don't do as often as I should. Every now and then I'll walk in the office in the morning and someone will say 'Oh, did you hear about such and such new virus that's going around?' and I'm thinking in my head that there is probably a new virus definition I should have downloaded. Then I will go to the [Windows NT] box and find that MIMEsweeper is already catching the infected messages," he says.

Virus Updates

Not that updating the virus definitions is all that difficult, Ferrera says. Rather than reinvent the wheel, MIMEsweeper works with the anti-virus detection product an IT organization may have already installed, invoking that product to detect and cleanse a specific virus when it thinks one is present. Zenith, for example, uses the Command Software (Jupiter, Florida) Virus Scanner for MIMEsweeper. "To update the virus definitions all I need to do is download them from the Command Software Web site," Ferrera says.

But Zenith doesn't take any chances when it comes to attachments. "If an e-mail comes in here with an attachment containing, say, a Visual Basic script that it doesn't recognize, MIMEsweeper has instructions to hold the message until I've looked at it," Ferrera says. "Typically what I'll do is check out the message to see if it looks okay before releasing it to the intended receiver."

Greater Control over E-mail

Ferrera also likes MIMEsweeper because of the control it gives Zenith over its e-mail traffic in general. For example, it can detect who's sending or receiving the most mail — which allows better resource deployment and load balancing. MIMEsweeper also helps Zenith to accurately and quickly diagnose user e-mail problems.

"We also use MIMEsweeper for scanning outgoing mail," states Ferrera. "I can think of one case in particular where we had an employee leave us who began soliciting his ex-Zenith colleagues to join him at his new place of employment. So we blocked all incoming mail from that sender.

Given the need, the system can also be used to scan all e-mail content for a particular phrase to protect against loss of trade secrets, or to block people from sending or receiving e-mail to or from specific addresses."

More Than a Sense of Security

MIMEsweeper can also help users with issues other than security related topics.

"Actually, someone came to me today — they were sure their e-mail had been lost. I was able to check the log files and see that, yes, the e-mail had come in but it had been mis-addressed," he says.

MIMEsweeper had not only held the mail, it had sent a message to the sender notifying them of the error.

"I would consider MIMEsweeper to be a 'must-have' for any organization," Ferrera says, "if only to protect yourself. I think the product is invaluable."

COMPUTERWORLD

This White Paper on Content Security was created by Computerworld's Custom Publishing group. Comments on this supplement can be sent to managing editor Stefanie McCann at (508) 820-8234 or stefanie_mccann@computerworld.com. This White Paper, as well as other custom supplements, can be viewed online at www.computerworld.com.

YOU HAVE MAIL

And it can blow a nasty hole in the side of your company. The most innocent-looking e-mail can be a silent letter bomb.

E-mail can circulate offensive content and get you sued. Or deliver your trade secrets to your competitors. It can cripple your network with spam, huge files and viruses. And sink employee productivity to a new low.

Content Technologies enables you to work in the e-world with total content security. Find out how to defuse dangerous e-mail and Internet content – before it sends you into damage control.

Get a free evaluation copy of our MIMEsweeper software along with our "Guide to Content Security" CD.

www.contenttechnologies.com/ads (888) 888-6883

© Content Technologies 2000

content technologies

MAXIMUM SECURITY FOR THE E-WORLD

said the answer is A — You should give confusing, conflicting accounts of the attack.
Ballmer: That's good enough for me, Regis. I'm going to go with my PR team. I'm going to say A — give confusing, conflicting accounts of the attack.
Regis: So, that is your. . . .
Ballmer: That's my final answer.
Regis: (Dramatic pause.) I'm sorry. The correct answer is B. You should provide truthful, consistent information.
Ballmer: Darn! I knew the answer was "Ignore it all and talk really loudly about something else!" I should have gone with my gut!

ALLAN E. ALTER

Open-source opens up dialogue on leadership

MANAGEMENT. LEADERSHIP. The words sound absolute; they have the feel of marble pillars. But can the principles of management shift? Can the concept of leadership shift and evolve? Could it be that there are new ways to succeed as a leader? The answer to these questions is yes, and the evidence for it lies within the IT world — or more specifically, within the open-source software movement.

Recently, several researchers— M. Lynne Markus at the City University of Hong Kong, Brook Manville at Saba Software and the late Carole E. Agres — examined how the open-source movement actually manages to create software ("What Makes a Virtual Organization Work?" *MIT Sloan Management Review*, Fall 2000). The people who have created Linux or belonged to Netscape's Mozilla.org don't function like normal organizations. They were, and are, groups of volunteers. They aren't managed by bosses who control salaries and bonuses. There's no way they could have been led by conventional means. And yet, somehow, they created some of the most important software in use today.

ALLAN E. ALTER, a former editor at *Computerworld*, is editor-in-chief of the *MIT Sloan Management Review*. Contact him at alter@mit.edu.

Given the many opportunities that IT professionals have today, how the open-source movement functions can offer insights into leading conventional organizations that are volunteer in reality, if not in name. The researchers' findings suggest new questions and possibilities for managing and leading, or ways that, if not necessarily new, can be more strongly emphasized than in the past:

Motivate by enhancing the reputation of the people who work for you. Public praise and providing opportunities are things good managers do already. But the open-source movement provides something else, too: the opportunity for wide visibility among your professional peers. Among the main reasons developers participate in an open-source project are the chance to be listed as contributors, the opportunity to interact with a wide group of people (even if by e-mail and postings) and the hope that many others will see the quality of their work. Could this be a way to attract the best people — both permanent and temporary staff — to your organization?

Lead within a stable core, not a stable organization. While open-source projects consist mostly of volunteers who can come and go at will, each project has a strong core of committed people who have a major hand in governing it. In the case of the Apache Foundation, it's 20 people, and in the case of the Perl Institute (which recently dissolved), just six. Could thinking of that core, rather than the top person in a hierarchy, as the leader provide a different and effective approach to leadership? Should sustaining the core be the main priority of a company's human resource efforts and compensation policies?

Don't assign staff to a project; have them earn membership. While anyone can contribute a fix or identify a bug, the authors noted, taking on a more responsible role in an open-source project often requires going through some kind of acceptance process.

For example, Apache volunteers achieve membership — and the voting rights it provides — only after a probationary work period, followed by a consensus vote of the "core." Could this model be applied to a "center of excellence" within an IT organization? Could members perform such functions as evaluating, developing, promoting and reprimanding staff?

Much has been written about leadership, and the field compels a close study of constants and best practices. But as the open-source movement indicates, leadership and management remain an open book, with many pages yet to be written.

READERS' LETTERS

Talbots had systems, leadership in place

AS THE former senior vice president of IS at Talbots, I found Carol Sliwa's article "A Classic Makeover" [Business, Sept. 18] to be very misleading. It sounds as though during my tenure, nothing was being done at Talbots, the leadership was in disarray and no money was being invested in IS.

Almost all of the initiatives that are mentioned were well under way when I and others left Talbots two years ago. IS spending had been purposely kept in line over the years as capital was channeled to store openings. The article fails to mention that Talbots' systems were so bad when I joined the company that the computer often wasn't available to accept catalog orders and the register system was taxing incorrectly.

During the 10 years I was with Talbots, systems were developed to support international expansion, and new POS, financial, payroll and human resource, credit, sales audit, catalog and distribution systems were put in place.

Bruce Ash
Vice president, IS
Dollar General Corp.
Goodlettsville, Tenn.
Bruce.Ash@DollarGeneral.com

Editor's Note: *Computerworld intended no disrespect toward previous employees at Talbots in our story, nor do we believe any was implied. Our reporter interviewed three long-term IT employees and the new CIO in researching the story, and we used dates and monetary figures supplied by Talbots. After the story ran, the company requested 100 reprints.*

Small failures matter

MANY IT disasters begin before the project starts ["Companies Don't Learn From Previous IT Snafus," News, Oct. 30]. Adequately defining project objectives, articulating requirements, choosing project leaders and champions and, most important, engaging the right service provider drastically improve the chances for project success.

Unfortunately, very few organizations have any best practices around project definition. That is why Practice.com has set out to become the best in launching projects and matching requirements to the best service providers available.

Your article couldn't capture all IT disasters and had to focus on the largest. How many $150,000 to $1 million projects balloon out of budget and end up as financial disasters for midrange enterprises? Our experience is that these midsize projects also suffer from significant failure rates.

Laurence S. Donahue
President and CEO
Practice.com inc.
Chicago

No IT rookie here

I'M SURE I speak for thousands of experienced IT professionals in saying that employment perks do matter ["CIOs: Recruit Trainable Rookies," Page One, Oct. 16]. When corporations are willing to save 20% to 30% in compensation by hiring rookies, they're passing up experienced and, more often than not, certified IT professionals who can be 200% to 300% more productive than the "trainable rookies." I for one will not accept rookie compensation packages.

Jon Willert
Alpha One Inc.
Omaha

Throw the case out

THE APPEALS Court in the Microsoft antitrust case has finally recognized that it is not competent to decide these issues, and both sides have conceded that point ["Court Caves in on Idea of Tutor for Microsoft Case," News, Oct. 30]. That is an important part of the process that I am confident will lead to a rejection of the government's case.

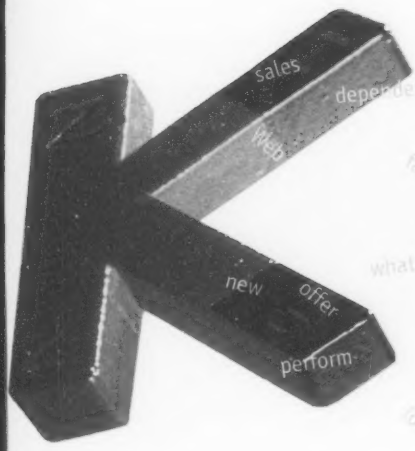
Winton Woods
Director
Courtroom of the
Future Project
University of Arizona
Tucson

More Letters, page 40

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

You told the Board your site
would attract millions of hits.
CLIC

What if you were absolutely right?



Suddenly the leading edge of e-business is a much more comfortable place to be. No matter how many customers you attract.

The dependence on web applications has grown beyond anything imagined only a few years ago. But failed transactions mean more than lost sales. They mean lost customers and a damaged brand reputation.

Web Applications Management. That's what is needed. And the first company to offer a total enterprise solution in this vital new field, with no retrofitting of your systems, is Tonic.

The ability to load-test and perform integrity assessments before systems go live. As well as perform on-going monitoring. Make the e-world far less daunting. Even predictable.

Up and running in hours, not days. Easy to use, yet with the scalability to simulate millions, not just thousands of simultaneous users.

That's Tonic. And that's better.

www.tonic.com

TONIC™

Guaranteeing Your Net Works.™

DAVID FOOTE

The flaws behind IT workforce salary surveys

EVER BEEN REBUFFED by your company's compensation manager when you wanted to pay an IT worker more than what surveys were suggesting he should be paid? If you protested by whipping out some of your own well-researched (though informal) market-price data, you were probably met with a cascade of mumbo jumbo about "statistical validity," "reliability coefficient," "compa-ratio" and "representative samples" before being shown the door.

DAVID FOOTE, a former corporate compensation professional, is managing partner and research director at Foote Partners LLC, an IT workforce research and consulting firm in New Canaan, Conn. Contact him at dfoote@footepartners.com.

But you should know that many of the most popular IT salary studies being used today by corporate compensation departments and published by large, reputable human resources consulting firms are too poorly designed and executed to be worthy of serious consideration. It's the dirty little secret of the IT benchmarking business.

It's not that these firms don't know the compensation business; it's their bread and butter. But they don't know enough about *IT workers*. It has spoiled their ability to be dominant in this important employee segment and opened the door to numerous small but fast-growing, IT-savvy human-capital boutique consulting firms.

The problem begins with the passive, low-overhead way that most of these benchmarkers collect salary data. It's a paper or online questionnaire filled out by a human resources professional motivated by a quid pro quo arrangement, such as a big discount on a copy of the published survey.

The instructions are fairly simple: "Here are a bunch of job titles that you will try to match with jobs in your company. Then, report to us what you're paying people in these jobs in the format we require." There's customarily a very brief description of each position.

Job titles like *financial analyst*, *accountant* and *sales representative* are universally understood. But what does the average human resources person do with *data warehouse architect*, *e-commerce programmer/analyst* or *business technologist*? When the position is broad, like senior systems administrator, does it make any difference if the salaries of all workers with this title are added together and an average salary reported, regardless of computing environment, such as MVS, Unix, NT or Linux? And what if the worker is part of a hot project team requiring specific functional business knowledge, strong project-management skills and up-to-date technical knowledge?

It matters quite a lot from a pay perspective, but many respondents are oblivious or not motivated enough to care. Employers are constantly changing IT job content and definitions but leaving job titles untouched. You're lucky if you can find decent coverage of the new titles on the most popular surveys, or meaningful data when they do show up. With passive surveys so deeply flawed, their statistical validity is laughable.

Another problem with these prestigious survey firms is that they don't publish often enough. IT compensation is too fluid to be benchmarked only yearly, yet that's still the norm. IT managers need semiannual data and sometimes quarterly numbers for their most precious in-demand jobs.

Above all, it's important that you and your compensation department agree on which employers count most in shaping pay in your labor markets, and that they're getting good intelligence about pay levels at these companies. The big survey firms sometimes rely too much on information collected strictly from their clients, or the firms sponsor local multiclient IT pay studies that don't include the right jobs or key companies with which you compete for talent. ◗

THORNTON MAY

The digital economy's future banks on trust

YOU CAN'T HELP but be struck by how little we really think about trust. The throbbing irony of our digital society may well be that this quintessentially human trait powers the pulsing heart of the semitechnology-obsessed and certainly technology-accelerated New Economy.

THORNTON MAY is corporate futurist and chief awareness officer at Guardent Inc., in Waltham, Mass. Contact him at thornton.may@guardent.com.

But trust is about to come out of the closet. When you increase trust, the New Economy booms. Decrease trust, the economy tanks.

The people managing the emerging digital economy will have to manage and manipulate the supply of trust. Trust defines our future. Trust may even be regulated and measured to the point that it shows up on our balance sheets.

Very few people have noted that the typical Web visitor is surprisingly naive regarding the amount of trust already given to digital purveyors of goods and services.

Consider the contemporary traveler who shows up at the airline counter with nothing more than a smile, a photo ID and an "electronic ticket." The magic ones and zeros magically collaborate to get him his requested aisle seat and credit him with frequent flier miles.

We trust our Internet service provider or employer not to overmonitor and publicly reveal our clickstream behavior. Should we? Would you trust your priest to hear your confession online?

The much-discussed migration to broadband technology in every home is predicated on the following:

- Users trusting that always being connected to hundreds of millions of unknown and as-yet-unproven-to-be-trusted e-buddies won't be harmful.
- Users being educated, then taking appropriate action to manage the risk of ubiquitous connection. For broadband to succeed, consumers must make significant progress in understanding what they can — and must — do to protect their digital assets.

Like it or not, I fear we're going to have to know what's going on security-wise with the myriad of intelligent devices that will increasingly define and populate our world. We need to do an audit to determine which of the "things" in our lives we can actually trust.

So, we may be doing this "trust" thing wrong. A quick-and-dirty examination of trust behaviors shows that the world deals with trust along two axes: things and whos. My research indicates that:

1. Organizations are predisposed to overemphasize "things," believing that we can buy some kind of technology that will make the trust issue go away. The biggest mistake CIOs will make over the next six months is to accept the unwinnable enterprisewide task of fixing the "trust problem" with technology. It can't be done. Technology will be part — but not all — of the solution. Case in point: Senior management at one company thought that buying firewall software could keep out untrusted visitors such as viruses, bugs and Trojan horses. But computer enthusiasts (sometimes referred to as "hackers") have anointed firewalls as the "crunchy outside surrounding a chewy center."

2. Organizations and senior management groups tend to underfocus on the "whos," not paying enough attention to whom we should or can trust.

Most people, whether they work in the business or consumer space, have little or no training in the creation, management and expansion of trust networks. The herd mentality that has most of us unabashedly trusting and clicking away may soon give way to societywide top-of-mind awareness. I became aware only recently that the off-the-shelf software that I buy isn't secure and can't be trusted. I fear that such top-of-mind awareness may, in very short shift, give way to a stampede of animals who suddenly become aware of danger.

What happens when we become aware of our fragility? The historical American instinct of how we confront frightening new awareness isn't good. (Remember the Salem witch trials? McCarthyism?) Are we on the cusp of persecuting hackers? Will we all 'disconnect' and go into a 'Dark Ages' of noncommunication? Can we trust our capacity to trust? ◗

The problem: your network is slowing down productivity, sales and even growth. The solution: BellSouth. We can give your company a data network that's not only faster, but also smarter and more efficient. By reconfiguring your existing infrastructure, we can give your network more functionality, so it can handle duties like transaction processing, data warehousing, security, storage and other more customized tasks that can help your business evolve. We'll also work with you to devise a comprehensive migration plan to keep you a step ahead of the competition, and make the future virtually unlimited.

>>>connect>>and create something™

BELLSOUTH®

WWW.BELLSOUTH.COM/EBUSINESS

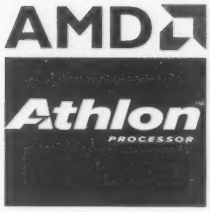
All trademarks contained herein are the property of BellSouth Intellectual Property Corp. ©2000 BellSouth Corporation

AMD
Athlon
PROCESSOR

YOU'D SMILE TOO IF YOU'D JUST BEEN NAMED

PC WORLD
2000 WORLD CLASS

The editors of PC World magazine judged hundreds of products based on performance, consistency, innovation and value. Their verdict? "AMD's Athlon Processor is a superstar in all four" and "Athlon-based PCs sprinted to the top of our corporate and home PC charts." These are just a few of the reasons that they chose the AMD Athlon™ processor as "Product of the Year." You'd think



PC WORLD MAGAZINE'S PRODUCT OF THE YEAR.

we'd be used to this by now. After all, AMD Athlon processors have already won more than 65 awards worldwide. But when we hear things like "record-breaking performance," "architecturally superior to Intel Pentium III" and "the first to hit a clock speed of 1 gigahertz, beating Intel at its own game," we still can't help but grin. You will too when you see what an AMD Athlon processor can do for your productivity. Log on to **www.amd.com/pcworld**.

© 2000 Advanced Micro Devices, Inc. AMD, the AMD logo, AMD Athlon and combinations thereof are trademarks of Advanced Micro Devices, Inc. Pentium is a registered trademark of Intel Corporation. See July 2000 issue of PC World for complete article.

Calling all commuters

I JUST READ Cezanne Huq's comments on commuting by car to New York in "Tales of Commuter Terror" [Business, Oct. 30]. I was born in New York and believe traffic has grown because of people who refuse to use one of the best public transportation systems in the country. I use the Long Island Rail Road and New York subway every day, and I can't remember the last time I was late for an appointment because of public transportation. I do understand that there are people who must drive to work, but the commute from Bronxville, N.Y., to Midtown Manhattan by train is probably less than an hour. I guess some people think it is convenient to sit in traffic alone rather than reading, relaxing or speaking with friends on a train, bus or subway.

Bob Gross
New York

A COMMENT by Marie Handschiegel illustrated one of the most annoying things about my commute: people who wait until the last minute and then try to merge into the long line of cars that got in the proper lane ahead of time, or who, like Handschiegel, bypass stopped traffic by driving on the shoulder. Thanks to Handschiegel, I now understand why they do it — they "feel better because [they] got past five or 10 people." But why is their time more valuable?

Even in Raleigh, I know certain places where traffic backs up every day. If there's snow, I know it will take me twice as long to get to work. But I figure everyone is in the same boat and wants to get to his destination just as much as I do. If everyone drove safely and politely, it would make floods, snow and just plain congestion more bearable.

Susan Marshall
Raleigh, N.C.

ERIK SHERMAN, like many journalists, quickly dismisses a potential solution in favor of telling us how bad things are going to get. He devotes a total of one sentence to analyzing light-rail: "High-tech solutions like light-rail might sound appealing, but they're more expensive than roads, according to The Road Information Program in Washington."

Who says light-rail has to be high-tech? And is light-rail just more expensive to build, or is it more expensive in terms of harm to the environment, the dissection (and eventual destruction) of neighborhoods and the incalculable costs of commuting stress? If Sherman doesn't have the inclination or space to give us the total picture, he should admit it.

Marc Briand
Lawrence, Kan.

OF *COURSE* commuting by car is "ghoulish." That's what happens when you use 2 tons of metal to move 170 or so pounds of flesh. Quit whining and use a train, bus, carpool or bike.

Lisa Brandt
Chicago

More Letters, page 44

Some advice on handling tomorrow s workforce: Start handling it today. With a blended model of applications and services that enables you to find, hire and manage the right contract workers, right when you need them. With a skills procurement solution that aggregates all your staffing suppliers into a single, private supply network. And with performance data designed to help you make the most informed hiring decisions, in the most timely manner.

SkillsVillage
A new force at work.

Ignite Your Digital Branding

"If you want to get venture capital, you'd better read this book. Companies will either brand or die. It's up to you."

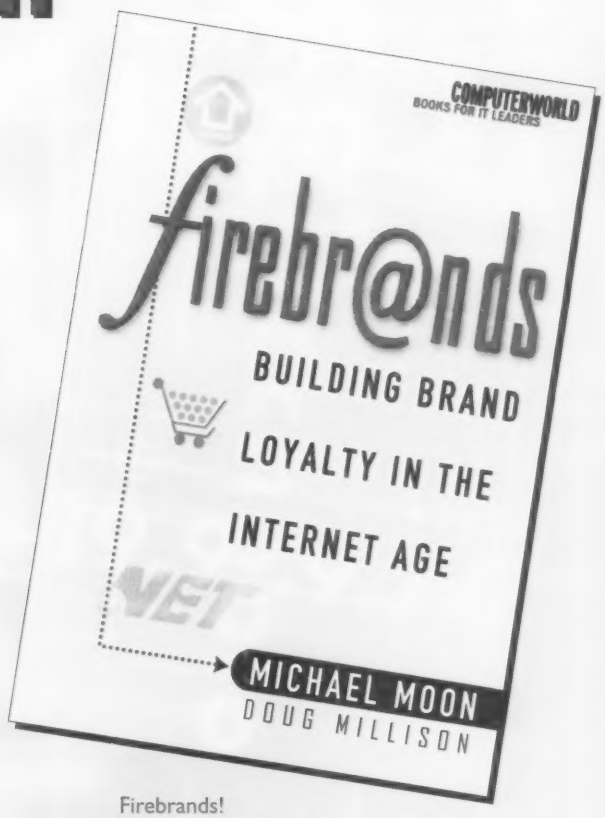
—Guy Kawasaki, CEO, *Garage.com*, Palo Alto, CA

"This book is a roadmap for exploiting the unique brand-building opportunities of the Net."

—Al Ries, *Ries & Ries Focusing Consultants*, Roswell, GA

"Michael has captured the essence of branding in the Internet age. His research is impeccable. This is a must read for anyone in marketing."

—Andy Brownell, Director of Marketing, *Compaq Computer Corporation*



Firebrands!
Building Brand Loyalty
in the Internet Age
MICHAEL MOON & DOUG MILLISON
$29.99
0-07-212449-0

Learn how to extend your brand strategy by merging legacy marketing with Internet-specific techniques

Available at online retailers and bookstores everywhere.

For more information on these and other Osborne/McGraw-Hill titles, visit our website at www.osborne.com.

OSBORNE
www.osborne.com

COMPUTERWORLD
BOOKS FOR IT LEADERS

Fujitsu Network Communications is opening eyes in America with revolutionary photonic technology, like wavelength division multiplexing systems fast enough to send 20 million simultaneous phone and Internet calls down a single hair-thin optical fiber. The boundless multimedia capacity Internet users before could only dream of.

©2000 Fujitsu. All rights reserved.

Look around. You're in the midst of a global maelstrom. A swirling mass of converging technologies and new business opportunities unleashed by the Internet. All waiting to be harnessed by companies like Fujitsu – the world's third largest IT services provider.* We've focused our energy and resources on creating technology to solve the unique problems of thousands of individual businesses. Last year alone we invested $4 billion of our $50 billion global IT and telecommunications revenues on R&D. Imagine, $4 billion. That's more than the total sales of many Fortune 500 companies. But that's what it takes to create next generation mobile technology, ultra-high-speed servers and leading-edge photonic networks. Innovations that keep your business one step ahead of the Internet. And light years ahead of the competition.

WHEN YOU CLOSE YOUR EYES,
WHAT DO YOU DREAM?

WHEN YOU OPEN YOUR MIND TO THE
FULL POTENTIAL OF THE INTERNET,
WHAT DO YOU SEE?

FUJITSU

THE POSSIBILITIES ARE INFINITE

www.fujitsu.com

*Source: IDC, December 1999. *Who Will be Leading the Global IT Services Industry in 2000?*: A Competitive Analysis by Mauro Peres, Sophie Janne Mayo.

H-1B survey leaves too many questions unanswered

THE FINDINGS are contrary to what I've experienced ["Study: H-1B Crucial to Economic Growth," Page One, Oct. 30]. Publishing conclusions without the basis implies a validity that is not necessarily there. Who funds the National Academy of Sciences? Who and where did it survey? What proportion of the survey focused on management responses vs. employee responses? What percentage of the respondents were "older"?

David Heller
Salinas, Calif.

WE CAN slice and dice the H-1B visa debate any way we want, but if anyone truly believes that U.S. workers are not getting shafted, then he has never tried to break into a C++ or Java job with a Cobol or structured language background.

Randy Marsh
Walnut Creek, Calif.
StarDisk@aol.com

IN 1994, I was downsized as recession gripped Massachusetts, so I joined a job-hunting and counseling group sponsored by the federal government. One of the first lessons was that age discrimination is real. Most of us assumed it started at age 40; the facilitator shocked us by saying it began around age 37.

Now the government says there's "no definitive evidence of age discrimination"? That facilitator sounded definite. People in the groups definitely thought they had encountered it. Who do you believe: the workers who can't get jobs and the facilitators within the government's own jobs programs, or this latest report?

Ed Lawrence
Natick, Mass.

WITH the layoffs in the e-world, there should be an equal amount of relief in pressure for H-1Bs. Also, have the organizations that are pressuring to increase the number of H-1Bs given any thought to how they would handle a reduction in a force made up of H-1Bs?

Paul D. Lane
Consultant
Futron Corp.
Washington
plane@futron.com

DHL at another level?

THE ARTICLE "Delivery Firms Pump $230M Into Wireless" [News, Oct. 23] is a little misleading. An analyst is quoted as saying that DHL Worldwide Express is "not at the same level" as UPS and Federal Express in deploying wireless technology.

DHL deployed the first wireless tracking service for WAP in October 1999. This was followed by multiple other wireless services.

While wireless use may be an exciting departure for U.S. companies, for real global companies like DHL, it is just one of the familiar, integrated channels of data collection and service provision.

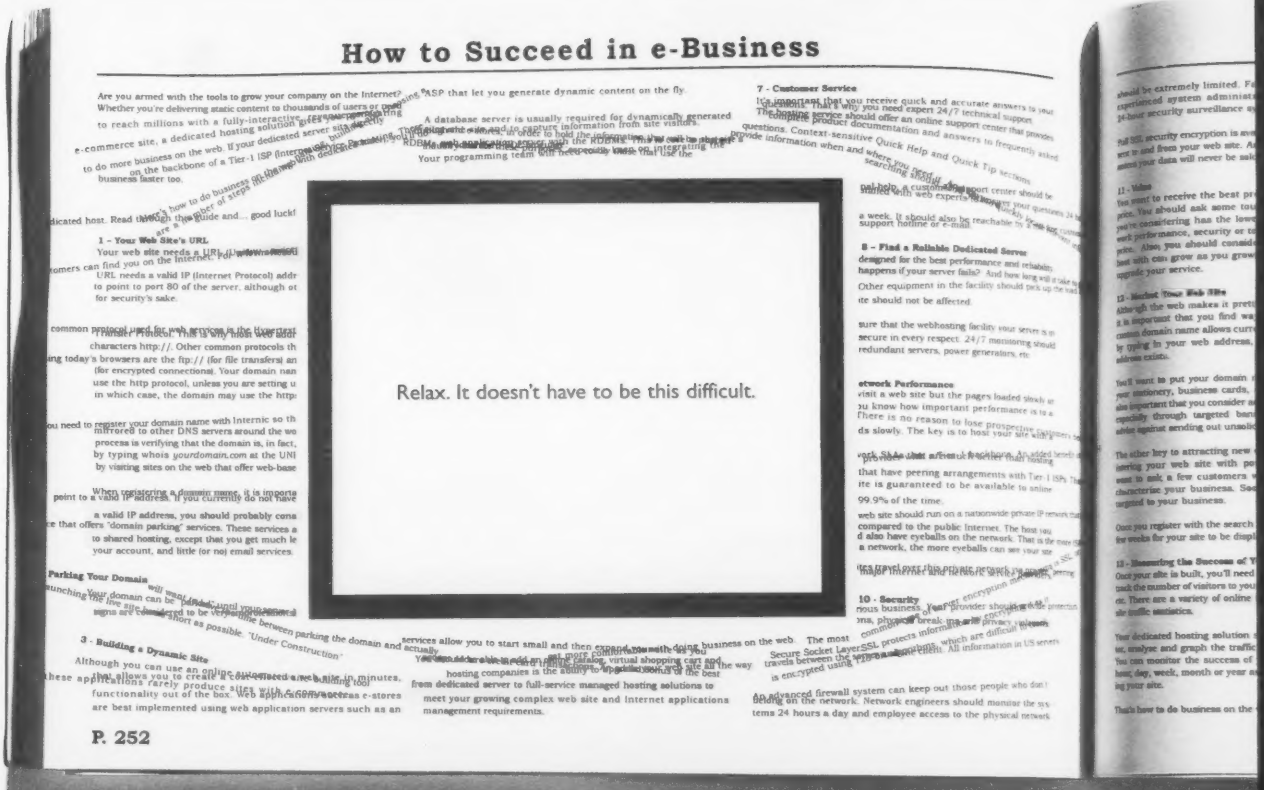
Colum Joyce
E-commerce strategy manager
DHL Global Coordination Center
Brussels

Escrow limits ASP risks

I READ with interest your article on the risks associated with application service providers ["Avoiding ASP Angst," Technology, Oct. 16]. While I agree wholeheartedly with your list of questions to ask before signing up for service, one of the most important was omitted: Will the ASP agree to signing a technology escrow agreement?

By establishing a technology escrow account, ASP clients would have access to the source code and any critical data for the application being hosted. The release of that information to the client can be tied to any number of conditions, including bankruptcy, loss of support or even the departure of key personnel. Without a technology escrow contract, it is difficult to effectively limit the risks of doing business with ASPs. Remember, ASPs have proprietary technology and data that normally would reside on-site at the client's location. Technology escrows can mitigate both risks.

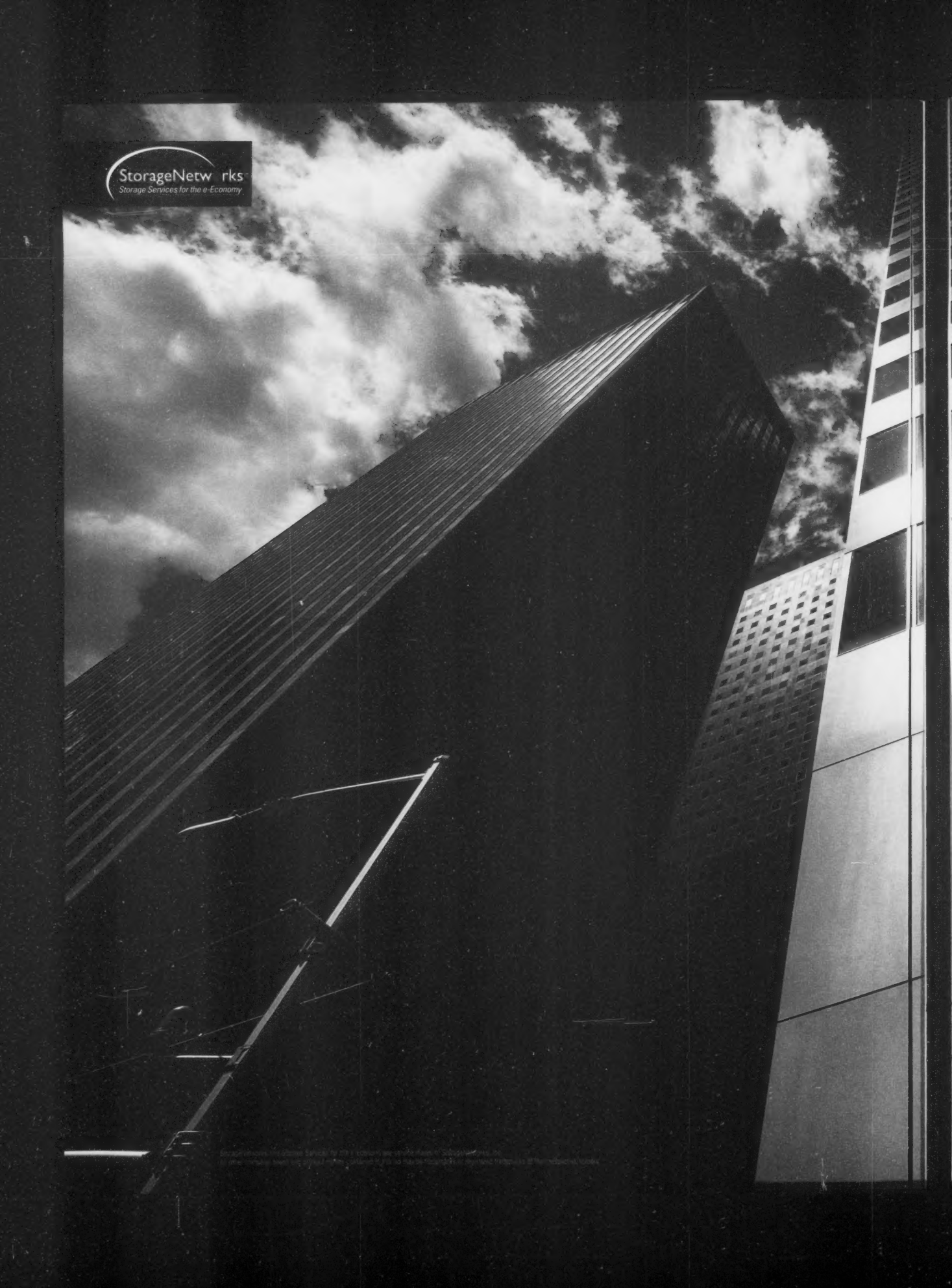
John Boruvka
Vice president of sales and marketing
DSI Technology Escrow Services
San Francisco



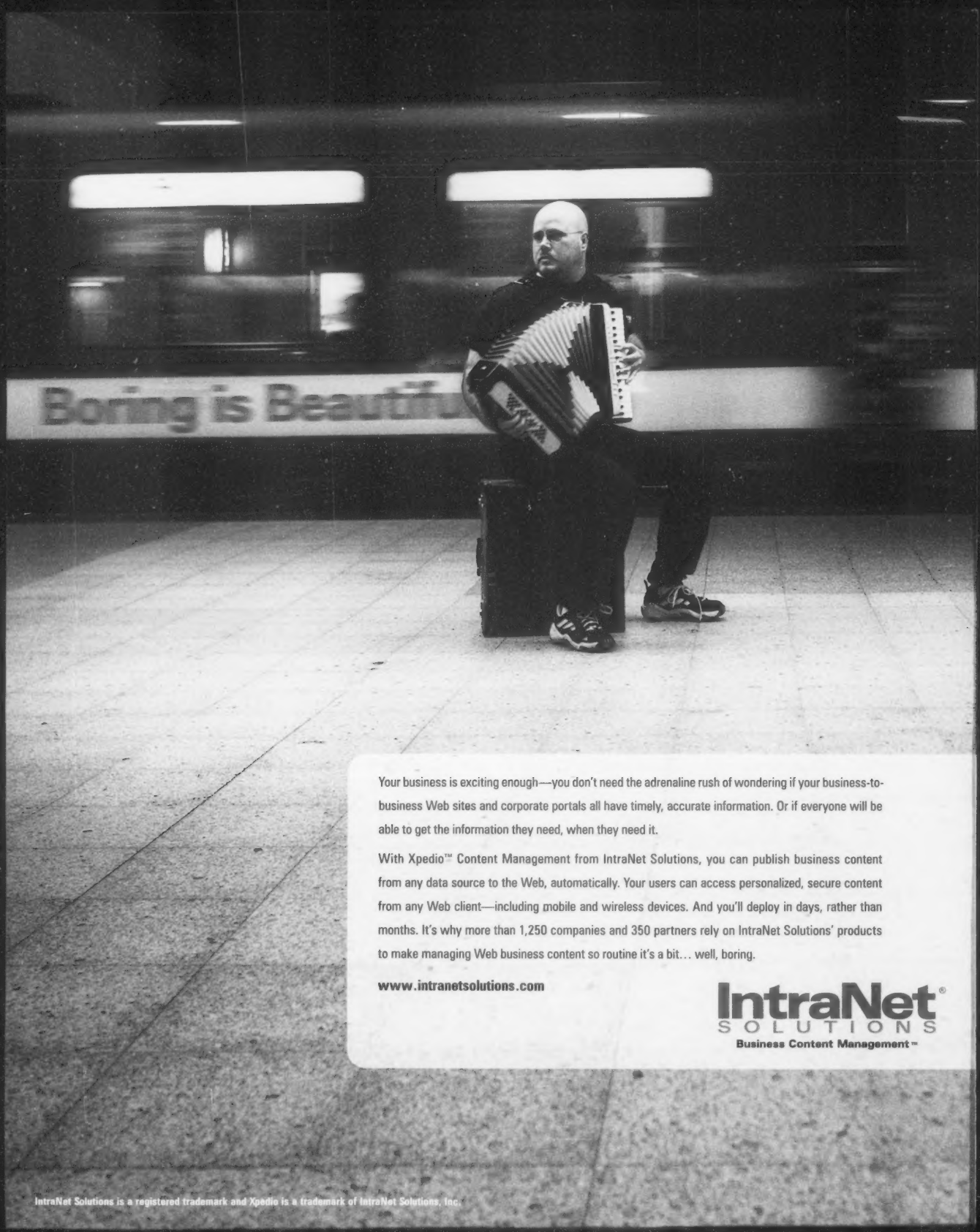
bluefield □
from CABLE & WIRELESS

Believe it or not, you really can have an e-selling, e-business online in 24 hours. Bluefield Dedicated Premier™ from Cable & Wireless gives you fast, firewall-protected web hosting for as little as $595 per month. Plus, Bluefield saves you time with online ordering, server management and support as well as the tips, tools and partners you need to maintain a successful web site.

Call 1-866-777-BLUE (2583) or visit www.bluefield.com/info to take a quick tour.
Enter reference code AACOM to see how Bluefield makes e-business easy.


StorageNetw rks
Storage Services for the e-Economy

Neither your competition nor new market opportunities will wait for you to add data storage capacity, hire the right people to productively employ that data, or to complete data backup and restore. That's why StorageNetworks™ provides an on-demand data storage infrastructure, network and software solutions that ensure secure, scalable and accessible data storage, and, of course, the expertise to make it all come together. This way, we save you from the distracting and costly task of storing, protecting and managing your data. In fact, we do this better and more cost-effectively than you ever could yourself. Allowing you to focus on leveraging your information and honing your competitive edge. To learn more about our secure, scalable, "easy-to-access" approach to data storage, visit us at www.STORAGENETWORKS.com.



Your business is exciting enough—you don't need the adrenaline rush of wondering if your business-to-business Web sites and corporate portals all have timely, accurate information. Or if everyone will be able to get the information they need, when they need it.

With Xpedio™ Content Management from IntraNet Solutions, you can publish business content from any data source to the Web, automatically. Your users can access personalized, secure content from any Web client—including mobile and wireless devices. And you'll deploy in days, rather than months. It's why more than 1,250 companies and 350 partners rely on IntraNet Solutions' products to make managing Web business content so routine it's a bit… well, boring.

www.intranetsolutions.com

IntraNet®
SOLUTIONS
Business Content Management™

IntraNet Solutions is a registered trademark and Xpedio is a trademark of IntraNet Solutions, Inc.

BUSINESS

KEEPING SECRETS

Secret offshore data havens are more than a myth of cyberpunk novels. HavenCo, which is based on a former antiaircraft gun platform off the coast of England, promises to host servers for customers and will dump data — and possibly servers, too — if the law comes looking for clients' secrets. ▸ 50

CULTURAL CONNECTIONS

Time and technology issues aren't the only pressures on IT folk. An increasingly diverse workforce is pushing IT workers and managers to adjust to multicultural differences. It's also forcing foreign workers to stand up to insensitive U.S. colleagues, Kathleen Melymuka writes. ▸ 55

OUTSOURCING E-COMMERCE

Affiliate marketing and advertising are waning as e-commerce revenue sources, but a host of vendors that will build the infrastructure and sell your products for you in return for a cut of the revenue are cropping up. ▸ 56

THE WAY TO WIRELESS

Third-generation broadband wireless technology is going to sweep through corporate America, Peter G.W. Keen predicts. IT folk shouldn't worry about consumer gadgets, however. The real impact will be in cutting wires inside the enterprise to make the whole place more productive, he says. ▸ 60

FIGHTING OFF WEB ATTACKS

Wouldn't it be nice to take online revenge against hackers who bust your site? Tools to do just that are proliferating, but counterattacking is a risky and legally untenable response, warn experts, who worry that innocent bystanders may end up victims in a hacking war. ▸ 73

LEARNING FROM EXPERIENCE

Charlie Lacefield, a 36-year IT veteran and former CIO at Dow Corning, says tech chiefs have to understand three things: technology, process and people. Those who can't explain how a business works to technical staff and who don't understand it themselves leave the whole department in the dark. ▸ 80

PUTTING THE COOL IN IT

Despite the popularity of the Web, teens still see techies as clueless dweebs. A new TV campaign is trying to turn that around and attract kids into the IT workforce to keep the skills crunch from turning into a technology disaster by 2008. ▸ 82

MORE

Business Resources 86
QuickStudy 88
Advice 90

SHELLEY HARMS, executive director of privacy at Verizon Communications, has to juggle privacy issues with the firm's revenue goals

THE PUSH FOR PRIVACY CZARS

CHIEF PRIVACY OFFICERS HAVE BECOME absolutely *the* fashionable thing to have at companies that want to ward off government encroachment or regulation. But making the job more than just a figurehead position requires not only the ability to master business-oriented organizational skills but also serious technical chops and the determination to keep them up-to-date.

62

Data Haven Says It Offers Freedom From Observation

Attitude and questionable nationality may make HavenCo the hot place to hide data

BY ANN HARRISON

DO YOU HAVE valuable data that you would like to store beyond the reach of regulators, nosy competitors and litigators? Officers at a new company based on a former World War II gun platform six miles off the coast of England promise that they can house your servers or data with little or no risk of it falling into the wrong hands.

HavenCo Ltd. was founded as a co-location facility whose value proposition is that it won't cooperate with national or international courts that order it to disclose data. "We offer a unique service where a single piece of paper will not give anyone access to our clients' data," said Jo Hastings, HavenCo's chief marketing officer. "We are not necessarily going to engage in warfare; we will just destroy the data."

HavenCo's headquarters are in the British West Indies, but its co-location facility is on a 60-foot tower rising out of the North Sea, in 24 feet of water, six miles east of the industrial port of Felixstowe on the southeastern coast of England. Once part of a network of anti-aircraft fortresses built to shoot down Nazi bombers en route to England, the platform was abandoned after the war.

In 1967, a bold former British army major named Roy Bates took advantage of a loophole in international law called "dereliction of sovereignty" to seize the tiny platform, declare it the independent nation of Sealand and proclaim himself prince.

Neither Great Britain nor any other country has recognized Sealand's sovereignty, but its ambiguous legal status gave HavenCo's founders the chance to rent space to store servers and build Internet connections to offer to customers.

Hastings said HavenCo has signed as many as two-dozen companies and organizations for a 90-day beta period. After fine-tuning its services and back-end systems, it will then open for business, charging $1,500 per month for a standard unit of rack space, plus bandwidth costs. HavenCo plans to launch another co-location facility at an as-yet undisclosed location within six months.

Hastings said demand for HavenCo's co-location services has been driven by concern over the British Regulation of Investigatory Powers bill, which gives the government the power to conduct covert electronic eavesdropping. It has also been spurred by the FBI's Carnivore Internet surveillance system, which has alarmed U.S. privacy activists.

"Carnivore just couldn't have done a better job for us. We were real happy when that came out," said Hastings, noting that many nations conduct surveillance and that it's not just criminals that would like to avoid it. "We like to think of ourselves as a common-carrier type of business; criminals use the road, but a lot of good people use the road, too."

Once Science Fiction

Data havens free of government control were first imagined by science fiction writers. The idea surfaced in the 1975 novel *The Shockwave Rider* by John Brunner, as well as other "cyberpunk" novels, including Neal Stephenson's *Cryptonomicon*, published last year.

When Bates took over the 6,000-square-foot platform, it was beyond the existing territorial limits of Great Britain. It has maintained its relative independence, despite Britain's expansion of its territorial limits to 12 miles, which encompasses the platform.

According to a press officer at the British consulate in New York, the British government doesn't recognize the sovereignty of Sealand. However, the government has generally kept its hands off, possibly because it was founded before Great Britain claimed the waters in which it stands.

The British Department of Health and Social Security, for example, ruled in 1984 that Roy's son, dubbed Prince Michael, doesn't have to pay his national health insurance fees when he lives in the fortress. The pension department also determined that Roy's military pension shouldn't be paid to him when he resides in Sealand, because he isn't in England during that time.

When Michael Bates fired warning shots at workmen servicing a buoy near the platform, he and Roy were charged with weapons violations. But a British court ruled that the laws didn't apply because they were outside the three miles that Great Britain then claimed as its territorial waters.

Not Defenseless

Despite its minuscule security force, Sealand isn't defenseless. It has threatened to launch a public relations war to defend itself if attacked. Also, the extension of Great Britain's territorial limits means that any country attacking the fortress would have to enter British territorial waters, which would trigger defenses from the U.K.

HavenCo supports customers offering anonymous payment systems, online gambling, pyramid schemes and pornography.

MAGNUM PHOTOS

HAVENCO PROMISES that it can keep clients' data secure by housing servers in a former gun platform, where sovereignty is uncertain but isolation is absolute

The company's acceptable-use policy forbids spamming, computer hacking and child pornography. Hastings said such activities could prompt law enforcement or Internet service providers to shut down its mainland Internet connections. HavenCo will drop offending Web sites or services that jeopardize its access to the Internet, Hastings added.

She claimed that HavenCo has received several hundred queries from businesses interested in co-location services and Web hosting, which it doesn't provide. Distributed-processing and file-sharing companies have been one of the largest groups of prospective customers, Hastings said.

Many people have also written to demand that HavenCo host embattled music site Napster for free, she said. However, a spokesman for Napster said the company isn't interested in HavenCo's services. Hastings said Internet casinos have asked to locate their transaction servers at Sealand. Some businesses that offer electronic-cash systems are also said to be interested.

Most customers said they are interested in co-location facilities for e-mail archiving or secure data storage. The majority of inquiries have been for secure transactions.

No Physical Access

According to Hastings, even customers won't have physical access to the Sealand fortress. Customers can provide their own equipment, as long as it is X-rayed and examined for bombs or surveillance devices before installation.

Although HavenCo technicians perform basic maintenance on the machines, the servers themselves are run remotely by customers who are responsible for their own actions. Hastings said clients must indicate ahead of time whether they want to be reimbursed for the cost of servers that will be sacrificed if Britain or another legal entity makes a credible demand for their data.

Citing privacy and security concerns, Hastings declined to name any firm that has signed on as a beta customer. The only customer HavenCo has named previously is Tibet Online, which represents the exiled Tibetan government and

Sealand, page 53

MILLION DOLLAR SERVICE WITH OVER HALF A MILLION IN SAVINGS.

Saks Incorporated has long been famous for attentive, personal service. So when they wanted to restyle their customer service operations for today's eBusiness environment, they chose Aspect. Using Aspect® eCRM solutions, Saks integrated three contact centers into a single virtual contact center. Without adding a single agent, Saks now handles 16% more customer interactions. Whenever—and however—their customers choose. It's all resulted in three-quarters of a million dollars in annual savings, while preserving Saks' legendary service for generations to come. It seems that success does indeed come gift-wrapped.

Get the whole story behind Aspect's solution for Saks at www.aspect.com/go/maxsavings or call us at 1-888-412-7728.

Aspect, the Aspect logo, and the phrase "The Starting Point for eBusiness" are trademarks and/or service marks of Aspect Communications Corporation in the United States and/or other countries. All other product or service names mentioned in this document may be trademarks of the companies with which they are associated.
© 2000 Aspect Communications Corporation

ASPECT
The Starting Point for eBusiness™

WE'VE GOT JUST ONE SMALL DETAIL FOR YOU TO CONSIDER WHEN YOU PLAN FOR BUSINESS CONTINUITY.

WHAT HAPPENS WHEN PLAN B FAILS?

SUNGARD® SECURE
THE NET BENEATH YOU.

It could be a fire. The worst storm in decades. Or a deadly virus. But when it hits, it could knock out your system for hours, even days. And you know how much that could cost. Unless you have the right business continuity plan in place. SunGard can help, with a range of highly responsive, surprisingly affordable options. (You will even spend less on a pre-configured SunGard recovery package than you would to buy a backup server.) And now we apply our disaster recovery experience and aggressive pricing to your other critical business needs. With SunGard's Internet and high-availability services, the people who need it always have access to your company's information. Call us or visit us online now. **YOU'LL GET OUR POPULAR BUSINESS CONTINUITY PLANNING GUIDE DR MADE EASY. FREE.** Then relax. When plan B fails, SunGard won't.

1-800-468-7483 EXT. 293 OR
WWW.SUNGARDRESPONSE.COM/ADV

SUNGARD®

Continued from page 50

Sealand

seeks to operate without the interference of China.

On the eve of the beta launch last month, David Del Torto, executive director of the San Francisco-based Crypto-Rights Foundation, announced that his organization will be among the first group of data-haven pioneers.

"It is important to be hosted by a government that is very friendly to the basic concepts of freedom," he said. "We can't really do that in this country anymore, and it is important to have one place in the world where we can."

Jim Dempsey, senior staff counsel at the Washington-based Center for Democracy and Technology, said any attempt to avoid the geographical jurisdiction of governments is ultimately futile, because nations can still exercise jurisdiction over their citizens and arrest employees of HavenCo or freeze bank accounts on their own shores if the threat is deemed great enough.

Investor Confidence

Investors, however, are banking on HavenCo keeping its head above water. The data-haven project has attracted investment capital from Avi Freedman, vice president of network architecture at Akamai Technologies Inc. in Cambridge, Mass., and Joichi Ito, chairman of Infoseek Japan. Freedman reportedly invested $500,000, and Ito reportedly put in $200,000. Another $400,000 was raised from anonymous investors.

Hastings said HavenCo's goal is to raise a total of $3 million before it closes its first round of funding at the end of the year. She confirmed that Freedman is interested in supporting Sealand partly because it could inspire other nations to rethink their laws on data surveillance and other restrictions.

In the meantime, the process of turning a gun platform into a fat-pipe server farm is moving forward. HavenCo has paid an undisclosed sum to the Bates family for a one-year lease on Sealand, with an option to purchase. The fortress is now equipped with two generators, a large fuel tank and enough food to endure a year-long blockade.

Nearly all of the seven 22-foot rooms inside each of the platform's support cylinders are being transformed into machine rooms, using the existing blast doors to withstand explosions. HavenCo is seeking to stuff the cylinders with enough data storage, servers and transaction processors to create a global networking hub.

Del Torto said he believes HavenCo is the ideal place to locate his foundation's archive, mailing lists and double-blind remailers for anonymous e-mail.

"We will put up a massive archive with everything published about cryptography, plus source code and tools, and no matter what country you live in, you can download whatever you like," he said.

HavenCo's $1,500 monthly fee includes basic management, possible extended management, physical security, power and discounts for prepaying for 10 months. There's also a $1,500 setup charge per machine. HavenCo said it can accommodate up to 10,000 standard units of rack space without expanding. It has also promised to deliver almost 1G byte/sec. of Internet bandwidth by the end of the year at cheaper prices than those in Europe.

According to Ryan Lackey, HavenCo's chief technology officer, the company is still a few months away from providing this, but it can offer 1G byte/sec. as needed to its edge caches, with tens of megabits per second to the facility through diverse routes. Lackey said HavenCo will buy transit and peering agreements from Internet service providers at multiple locations around the world and that it will install high-capacity routers at major facilities. By installing routes and peering at remote locations, Lackey said, HavenCo can install edge caches and then handle the return of data back to Sealand servers.

Satellite Backup

If potential providers such as Amsterdam Internet Exchange BV and London's Telehouse International Corporation of Europe Ltd. are pressured to cut Sealand's link, HavenCo said it can reroute data to satellite communications and other Internet service providers.

In May, HavenCo installed three satellite connections, but Hastings declined to name the providers. HavenCo has also set up a 155M bit/sec. microwave link, provided by New York-based Winstar Communications Inc., that Hastings said HavenCo is testing.

Hastings predicted that HavenCo will pull in between $50 million and $100 million in revenue by the end of its third year in business. But, she added, much of the money will be reinvested in expensive projects such as laying fiber to the fortress, a project the company hopes to finish late next year.

Neither the U.K. nor any other nation has yet attempted to exercise jurisdiction over Sealand, Hastings said, but attempts by angry nations to cut HavenCo's Internet connection could be best countered with redundancy.

"We would like to get multiple jurisdictions in the next year and a server or two running in a few different places so that if they cut us off, despite their best efforts, we will have capacity elsewhere," said Hastings.

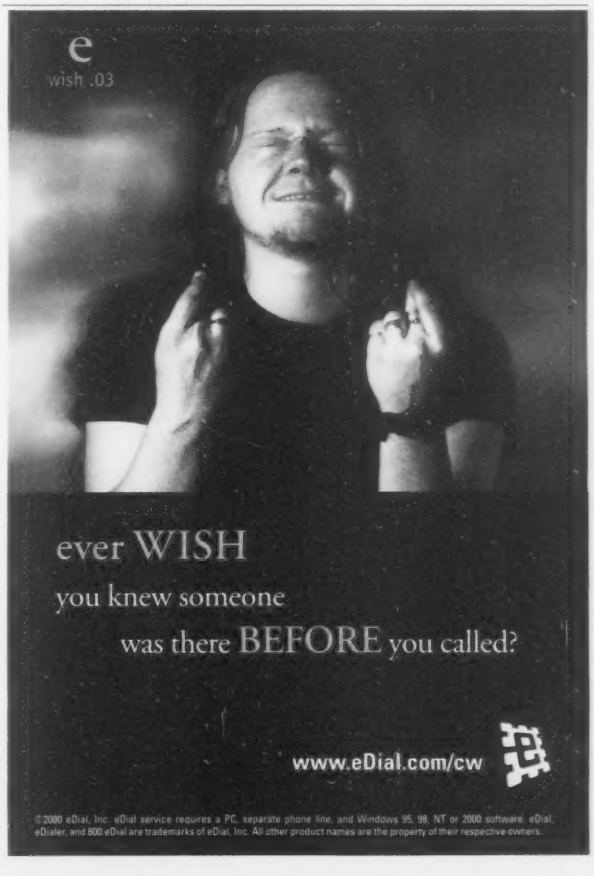
Del Torto said he believes chances are good that some nation will try to harass HavenCo, but the intelligence community will probably choose covert interruption of connectivity rather than direct intervention.

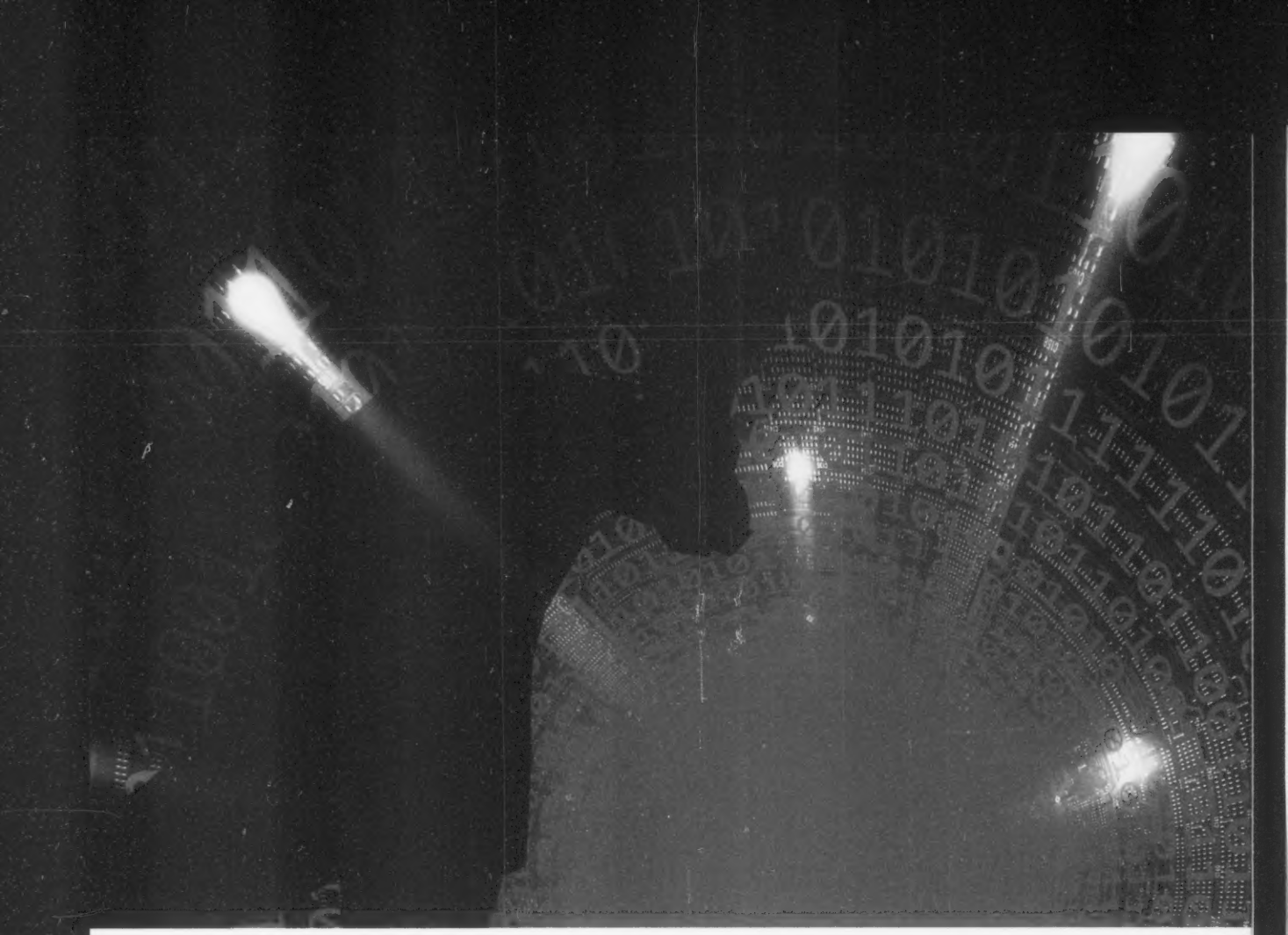
"There is always an opportunity for someone to come in with a big stick and threaten them, but their business model seems quite sound for having an answer to that kind of thing," said Del Torto.

Harrison is a freelance writer and former Computerworld staff writer.

MAGNUM PHOTOS

HAVENCO'S DEFENSES include the ability to destroy servers to avoid handing over data to governments





Don't be mystified by SAN solutions.
The choice is clear.

BROCADE

Combining award-winning Fibre Channel switches and SAN management software, Brocade solutions provide scalability, simplified storage management, system interoperability, and availability. Brocade partners with major storage and systems OEMs and Integrators to provide SAN solutions optimized for LAN-free and serverless backups, storage and server consolidation, disaster tolerance, and high-availability applications. It's no wonder that Brocade is the industry leader—and the clear choice—for SAN solutions.

NetworkWorld Blue Ribbon WINNER

Just ask the judges at NetworkWorld, who recently gave the Blue Ribbon Award for best product to Brocade SilkWorm switches. Visit www.brocade.com and click on the award to learn more.

©2000 by Brocade Communications Systems, Inc. All rights reserved. Brocade and the Brocade logo are registered trademarks of Brocade Communications Systems, Inc., in the United States and/or in other countries.

KATHLEEN MELYMUKA/DIVERSITY

IT 'Outsiders' Don't Have to Feel Alone

FOR MINORITIES IN IT, landing a job is only half the battle.

In their book, *From the Outside In* (Amacom Books, 2000), Renee Blank, Sandra Slipp and Vincent Ford write about people who find themselves isolated from their co-workers and unhappy on the job because of their race, gender, age, ethnicity, sexual orientation, religion or disability. While the book looks at the U.S. workplace in general, Slipp suggests in an interview that much of its advice is particularly applicable to minority workers in IT.

The book uses a series of case studies to illustrate problems and solutions for minority workers. It cites Fred, a black senior engineer who feels increasingly isolated and disrespected at his new company and concludes that his co-workers are racially prejudiced; Waheed, a project manager and Pakistani immigrant who seethes when colleagues joke that his Muslim religion makes him sympathetic to terrorists; Karen, a Chinese-American systems analyst whose cultural inclination to be reserved and respectful of co-workers leaves them uncertain of her expectations; and Dan, a disabled systems analyst who feels so vulnerable that he's afraid to take any of the risks necessary to move forward on his job.

KATHLEEN MELYMUKA is a *Computerworld* feature writer. Contact her at kathleen_melymuka@computerworld.com.

Anticipating Bias

Slipp notes that minorities sometimes anticipate bias, and those expectations can become self-fulfilling prophecies. "Many people expect the worst," she says. "They think there will be prejudice out there, and they don't look for people who will be friendly to them."

Fred and Waheed, for example, need to give people the benefit of the doubt and recognize the difference between misguided kidding or ignorance and actual hostility, Slipp says. They may be tempted to withdraw rather than confront people over hurtful comments, but that would be a mistake.

By explaining differences to coworkers, they can educate them, clear the air and make everyone more comfortable. "Remember, it's in your long-term interest," Slipp says. "If you act hostile or withdraw, you suffer."

Slipp says cultural characteristics frequently get in the way of advancement, especially in IT. While Americans are taught that "the squeaky wheel gets the grease," Asians learn that "the nail that sticks up gets pounded down," and Hispanics feel it's rude to speak out and "take the place of honor" from those with more seniority or experience. As a result, an Asian may not ask for a raise or new assignment because drawing attention to herself is contrary to her cultural mores. A Latino may not speak up at a meeting, feeling that would show disrespect for those with more seniority. Both may expect that their work will speak for itself, and they may end up quitting if they don't get the recognition they think they deserve.

"You must make people aware of what you have accomplished and what you are able to do," Slipp says. For example, she advises, speak out, talk about projects, be a resource to others.

IT workers — particularly those from outside the dominant culture — have to resist the inclination to be loners, she says, adding, "Fifty percent of your job is interpersonal relations." That means you need to make an effort to connect, even if it's just stopping at someone's desk and making conversation. "Maximize mutual interests," she advises. "Empathize with someone else's problems. If someone asks you to go out for lunch with them, go."

Outsiders like Dan, the disabled systems analyst, often feel particularly visible and vulnerable, and as a result they seem to be more risk-averse than others, Slipp says. This is also true of racial minorities. A national survey conducted by one of the authors found that while 85% to 90% of whites feel they take risks on the job to advance their careers, only 65% of Asian-Americans, 50% of blacks and 40% of Latinos feel that way. "Take risks!" Slipp says. "Don't be so cautious. Think of a new way of doing things and propose it."

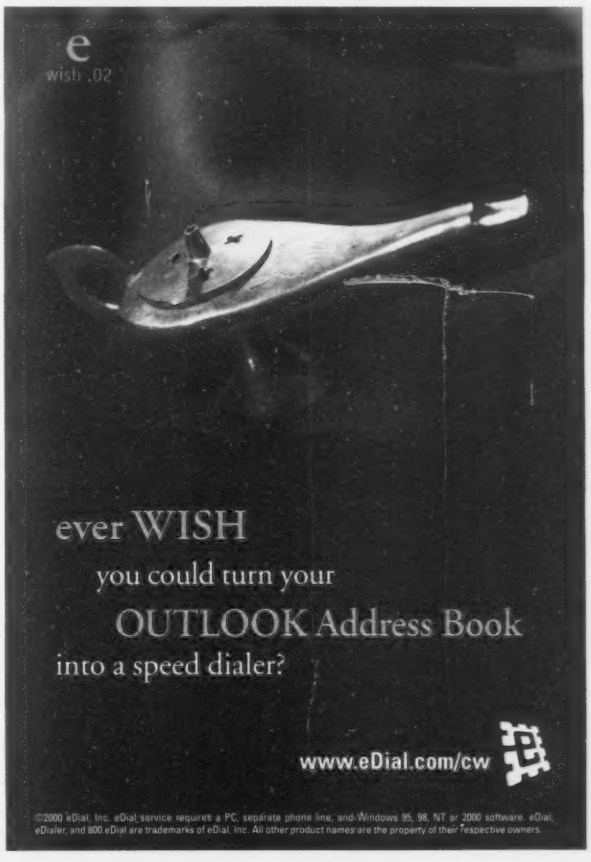
People from other cultures often resist this kind of advice for fear of "selling out" to fit in, Slipp says, but she stresses that buying into the work culture doesn't mean selling out your own. "You can maintain your own culture but stretch and see how you can also fit into the organization," she says.

If ever there was an opportunity for diversity to flourish, it's today in IT. But according to Slipp, it takes initiative and daring.

"The concrete ceiling is cracking, and it is possible to move forward, but nobody will pluck you up and do it for you," she says.

MOREONLINE

What do you think? Post your opinions in the DiversITy Forum at **www.computerworld.com/diversityforum.**



E-Commerce Solution: Let Someone Else Sell Your Product

Outsourcers promise profits, low effort

BY JULIA KING

Senior management, investors and shareholders are all demanding that Web sites make a lot more money than banner advertisements and affiliate sales have been bringing in.

As a result, more companies are focusing on direct product sales, often with the help of a new breed of e-commerce services provider that, for a share of the profits, will handle everything from contracting with product suppliers and warehousing inventory to shipping orders and collecting payments.

CrossCommerce Inc., Vitessa Corp., iVendor Inc., Iconomy.com Inc. and Escalate Inc. are among these new private-label e-commerce players.

They all operate behind the scenes, invisible to visitors at their customers' Web sites.

In some cases, users of these new outsourcers said they can make as much as three times the profits they made previously under affiliate marketing deals with online retailers such as Amazon.com Inc.

"The affiliate model is much more of a hand-off of your client," said Carol Baroudi, an analyst at Hurwitz Group Inc. in Framingham, Mass. "The draw is in keeping your client, which is enabled by these third-party providers."

"We wanted higher margins and more flexibility," said Carl Ware, manager of e-commerce business development at San Francisco-based Imagine Media, an Internet publishing company that uses San Francisco-based CrossCommerce's service.

With affiliate marketing, "you're primarily taking people to another property, and you're getting about a 5% commission," he said. "With CrossCommerce, the [profit] margin is built in at 40%, which you share with CrossCommerce, but get to keep between 75% and 80%."

Vendors tout the minimal investment users need to make in both information technology and dedicated e-commerce personnel.

When Nicasio, Calif.-based Lucasfilm Ltd. released the movie *Star Wars, Episode I: The Phantom Menace*, it was Sunnyvale, Calif.-based iVendor that handled all of the online preorders that were to come bundled with a special *Star Wars* poster.

"Lucasfilm wanted to do the preorders, but they had too many internal initiatives," said Jay Millman, vice president of marketing at iVendor.

Behind the scenes, iVendor handled all of the supply-chain systems integration necessary not only to process the video orders but also to package each video with a poster available only by ordering at the StarWars.com Web site.

Such processes are possible because "as we get more clients, we have leverage to go back to our suppliers and negotiate and demand better offers," Millman said.

CrossCommerce — through partnerships with product manufacturers and distributors — also has its own electronic catalog of some 18 million products. Customers can point and click through these to embed individual products within the content pages of their own Web sites.

Alternatively, CrossCommerce has an automated merchandising application that reads through Web page content and then automatically selects appropriate products and embeds them on a customer's Web page.

"You're kind of at the mercy of whatever products they have as they're building up their own inventory, which is one of the drawbacks," said Ken Arnold, CEO of Miami-based EnSpot.com Inc., which lists more than 1 million music festivals and entertainment events at its Web site.

"But the flip side is that if I focused on products I would want, I'd also have to worry about the management and programming aspects" of e-commerce, Arnold said.

Affiliate Marketing vs. Selling Via E-Commerce Outsourcers

AFFILIATE SALES

- Profit margins average between 5% and 10%.
- Web site visitors are redirected to a different Web site to make purchases.
- Separate partnerships with multiple product suppliers are required.

E-COMMERCE OUTSOURCERS

- Customers keep between 75% and 80% of profit margin.
- Customers pay one-time setup fees and monthly maintenance fees that typically start at $100,000 and $500, respectively.
- Customer has one contract with outsourcer; outsourcer handles multiple contracts with suppliers.

PIMM FOX/VOICE FROM THE VALLEY

Only today matters

JUST WEEKS after the World Series, nobody thinks about the New York Mets anymore. Which only goes to prove that you are only as good as your last assignment. CIOs and IT managers are judged not on what they did three months ago but on what they are doing today.

That's one reason why it was a struggle to get Evan A. Bauer, director of global information technology at New York-based Credit Suisse First Boston Corp., on the phone.

Bauer and his team manage 80 public Web sites and 1,500 intranet sites, supported by nine data centers.

The day I called, the backup system for his Web sites had kicked in because the main system had unexpectedly crashed. Not good, but not unusual for such a big Web site.

CIOs and IT managers have to juggle such emergencies every day.

Credit Suisse uses Sunnyvale, Calif.-based Interwoven Inc.'s TeamSite content-management software and services to reduce the load of managing thousands of pages with content from many sources.

It's a 24/7 job, and not one that can be interrupted easily. I spent a lot of time on hold that day.

While waiting, I connected with another hyper technology manager, Ken Venner, the new CIO of Irvine, Calif.-based Broadcom Corp.

His role at Broadcom, which designs telecommunications chips, requires instant response to IT issues.

"We had to move 25% of our staff in Northern California from one location to another quickly, without any downtime for the engineers — customer accounts, sales records, everything," said Venner.

"I have to know what's going on with the engineers so I can be ready to support memory needs, or I have to prepare for huge network needs at the end of a design cycle," he said.

Some requests that might fall in the "miscellaneous" category also need to get filled fast.

Case in point: Henry T. Nicholas III, the president and CEO of Broadcom, was yachting in the Caribbean. Nicholas needed high-bandwidth, full T1 capability on the boat. He needed a seamless transition from desktop to topside. With a CEO who Venner characterized as "intense and focused," the challenge of getting the satellite dish on the boat and deploying the network brought new meaning to the word now. Venner's crew beat the deadline. The CEO never knew how hard it was.

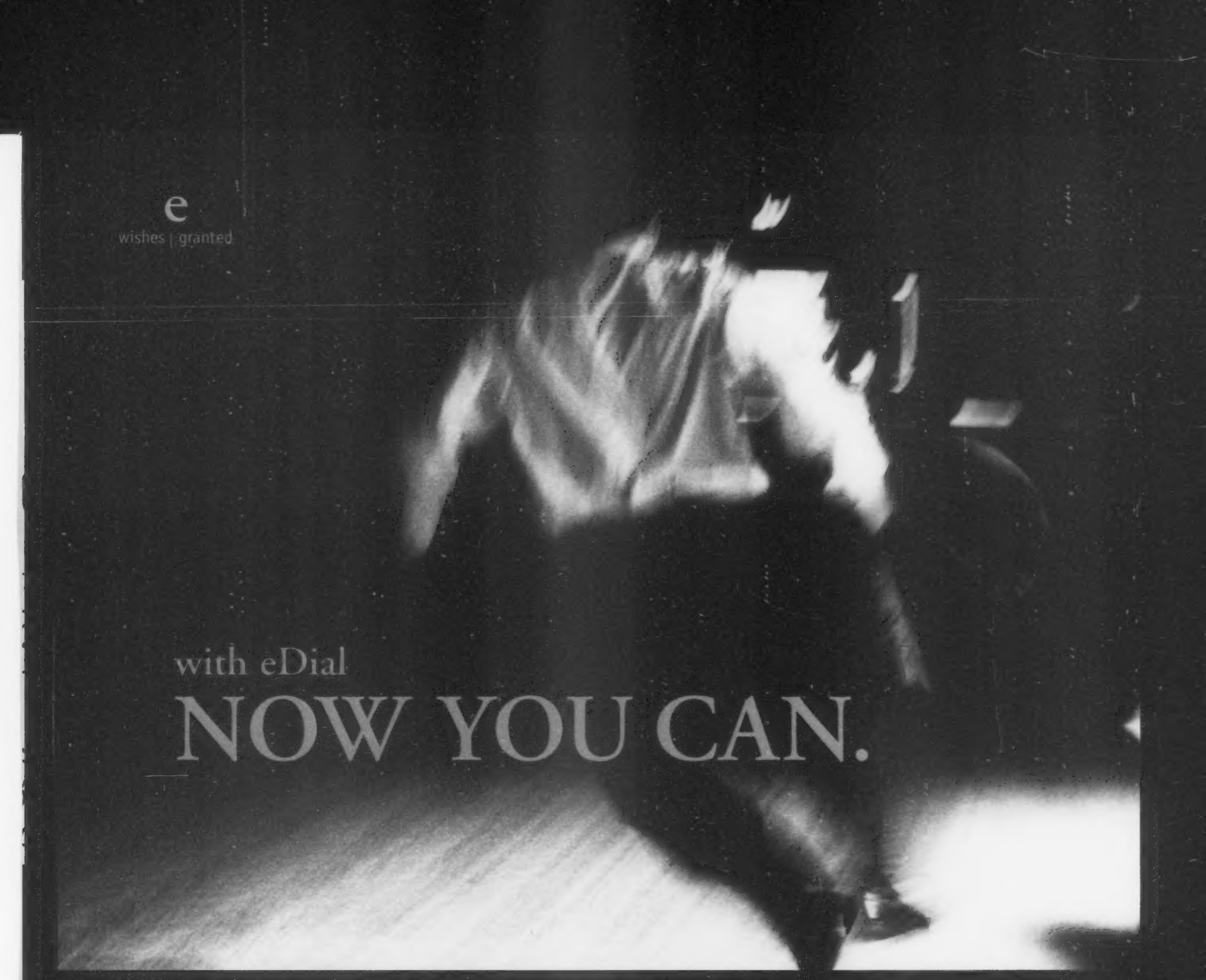
By this time, Bauer had put out his latest fire and was back on the phone with me. He gave me a rapid-fire description of how TeamSite cut the number of content change-induced problems by 95%.

What was more compelling was how fast they moved to TeamSite. They moved all their pages into it in one weekend.

All in a day's work for a CIO — who must operate at a speed people in other business units are just starting to get used to.

The network's always on. You're always on call. And you're only as good as your last project.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.



"Click to call" dialing from your Outlook™ or Palm™ address book, group calling and more.

With eDial, all your communications wishes are granted. eDial uses the Internet to leverage your electronic address book. The result? Radical new capabilities for you and your telephone:

- Click to call directly from Outlook and Palm for speedy, no-brainer dialing. (If you don't already have an electronic address book, eDial lets you create one at no extra charge.)
- A click of your mouse brings in up to 8 people on a group call—with no PIN numbers, added fees, or complicated conference bridges.
- Enjoy secure Instant Messaging when a quick message is all you need—and have the option to turn it into a real phone call with a simple click.
- Want to encourage more callbacks? eDial provides you with a toll-free "800eDial" URL to e-mail to your customers or prospects—all they do is click on it to call you back.

Visit our website and sign up today. Or, go through our quick demo and see how easy it is to quit snail-dialing and start eDialing!

www.eDial.com/cw
877.638.2835

eDial™

©2000 eDial, Inc. eDial service requires a PC, separate phone line, and Windows 95, 98, NT or 2000 software. eDial, eDialer, and 800.eDial are trademarks of eDial, Inc. All other product names are the property of their respective owners.

Internet Changes Insurance Back Offices

BY MARIA TROMBLY

For 128 years, five generations of Maloys provided casualty and property insurance to businesses in New York. But when it came time for Richard Maloy Jr. to take over the family business from his father, the company was doomed. "I killed it," Maloy readily admits.

The problem? Maloy was bitten by the technology bug when he was running the company's Princeton, N.J., office and selling insurance to high-tech firms.

"If you hang out with these [tech] guys long enough, you get inspired by what they do," Maloy said. "You just want to become one of them."

But moving the agency online wasn't simple.

The problem, according to Todd Eyler, an analyst at Forrester Research Inc. in Cambridge, Mass., is that individual insurance carriers haven't been able to simplify and standardize application forms. The most likely place for that innovation is with the agents, he said.

"The carriers tend to react and not be proactive," he said. "But if they have an agent that writes a lot of business for them and comes in with an idea that makes them more efficient and can bring in more business, they will listen."

To take advantage of the new possibilities, Maloy got his father to sell off the family business. He then formed Insurance Revolution Inc. (*www.insurehightech.com*) to concentrate on high-tech clients.

Electrifying Forms

Since it's an uphill struggle to get all the carriers to agree on a single application form, Maloy decided to jump-start the process by streamlining the communications with one of his carriers, St. Paul Cos. in St. Paul, Minn. The first step was to simplify paper forms and turn them into XML fields to be used in online forms and electronic data transmission. This part will be up and running by next month, he said.

Meanwhile, Maloy is working with his other carriers — including American International Group Inc. (AIG) in New York, Atlantic Mutual Cos. in Madison, N.J., and four others — to add their requirements to the system.

"Once we get it to three or four carriers, we start to pilot with other agents," he said. "Right now, we have 35 good-size agencies interested in using this platform." Though the e-commerce initiatives get the most attention, it's the improvements in the back-office processes that are driving the industry to the Internet.

"Everyone focuses on the sexy sites, the graphics, the portals," said Scott Alexander, AIG's chief e-business officer. "But below the water line are the operational efficiencies, increased data quality and transfer, multiple system connectivity. . . . That's where the opportunity to really affect the bottom line is."

100million
users accessed portals powered by Verity.

Managing your information is critical to your business success. After spending millions to bring users to your portal, are you fully maximizing your returns?

Verity, a recognized industry leader, powers business portals that deliver information when and where it's needed.

Top business leaders already use Verity software. Turn to the leader for scalable, robust and flexible portal solutions.

Verity™
Powering Business Portals

T. 877.739.5207 | www.verity.com | VRTY

*WorldCom and Digex recently entered into a resale agreement prior to WorldCom's pending merger with Intermedia. © 2000 WorldCom, Inc. All Rights Reserved.

HOW HARD (CRASH) COULD (CRASH) IT BE TO RUN YOUR OWN (CRASH) WEBSITE?

There's an old saying, "If you want something done right, you've got to do it yourself."

How do we know it's old? Because no one from the digital generation would ever say it.

The fact is, websites are fragile things. And unless an experienced web hosting provider is helping you, they're liable to break down from time to time.

Enter one very experienced provider named WorldCom.

By teaming up Digex with our UUNET arm, we're able to offer you a comprehensive e-business solution.* Not just one of the most reliable IP networks in the industry. Not just data centers all over the world. But the far more critical, human element: an all-star team of web hosting experts that blue chip companies trust with their mission-critical applications.

Visit us at www.wcom.com/generationd. And find out what it's like (EASY) to have WorldCom (EASY) run your (EASY) website.

generation d

WORLDCOM.

WORKSTYLES

What's it like to work at . . . Marriott International

Interviewee: José Porro, director of sales decision support, information resources department; Porro is certified as a project management professional by Newtown Square, Pa.-based Project Management Institute.
Company: Marriott International Inc. (*www.marriott.com*)
Main location: Bethesda, Md., a suburb northwest of Washington; information technology staffers are dispersed across headquarters, a data center in Frederick, Md., and facilities in Rockville, Md., and Wichita, Kan. Some of the larger hotels also have systems managers.
Tenure: Since 1998
Number of IT employees: 1,400
Number of employees (end users): 153,000, including 6,000 salespeople, who are Porro's primary end users
Major IT initiatives: A PeopleSoft Inc. implementation, expanding online business applications, implementing Seybold customer relationship management systems and "pumping up" the global network infrastructure
IT training for next year: "An overall initiative is to learn Method One, an applications development methodology developed by Andersen, and to get more project management training. There's a big push to certify as many people as possible. Also, we'll have PeopleSoft training for IT and end users."
Employee reviews: "It's a formal annual process where managers review the staff against the objectives set in your last review and set new objectives for the next year. We also have project reviews where we go over lessons learned."
Career-path options: "We have a program called Career Journey, and in that, employees can identify career paths they want to pursue within specific job families, such as operations, technical services, application integration, business integration, project management, support or leadership."
Bonus programs: "We have different IT bonus programs at the management level and senior technologist level. Also, a director or manager can give rewards or recognition to lower-level employees, like a cash award or a free weekend at one of our hotels for a job well done."
Workday: Eight to nine hours on a typical day. "We have 24/7 coverage, so there's always someone on hand. But we generally have a flexible schedule, and Marriott is very focused on balancing project needs and personal needs."
Must people carry beepers? Cell phones? Yes; on-call workers are on a pager rotation. "There's a huge percentage of employees who carry cell phones for personal use because Marriott has a discounted plan with a local carrier."
Kind of offices: Cubicles. "We're renovating all of the cubes companywide and upgrading the furniture, so right now, there's a mix of the older cubes and the new luxury cubes."
On-site amenities: A day care center, gym, gas station, convenience store, dry cleaners and bank. "Marriott takes the hospitality culture and brings it into the corporate office. All the on-site amenities are basically what you'd find in a hotel."
In-house cafeteria/food service: Yes; features a salad bar, a deli, a grill and rotating daily stations that serve ethnic food such as Italian, Greek, Thai, Mexican and more.
Little perks: Hotel discounts, an annual summer picnic and "one of the best holiday parties I've ever come across. They go all out. We take over one of the local hotels, have live bands and food galore."
Last companywide/department perk: Associate Appreciation Week, a companywide event capped off by a big picnic with a live band and an historic theme that hearkens back to Marriott's roots as a hamburger stand in 1927.
Would employees feel comfortable e-mailing J.W. (Bill) Marriott Jr., chairman and CEO? "You don't even need to e-mail him. When he eats here in the cafeteria, he stands in line like everyone else, and you can go right up to him."

– Leslie Goff (lgoff@ix.netcom.com)

PETER G.W. KEEN

Wireless productivity

THE PC SNUCK UP ON US. It was a full decade after the Apple II's debut before IT embedded the PC in its operations and business in its thinking. Similarly, the Internet was around for more than a decade before it, too, snuck into IT and business awareness.

Wireless won't sneak up. Soon, just about every innovation in Internet use will be wireless-centered. Early initiatives such as WAP phones and PDA add-ons may be limited, clumsy and slow, but with third-generation (3G) broadband coming by 2002, plus global telecommunications megamergers, the wireless message is being shouted from the rooftops to the basements.

But it's the wrong message for business. It's a consumer message about how to create demand for services that will soak up the massive supply of new wireless devices, chiefly the Internet-enabled phone.

There's another — and better — message:

- As with the Web, the early wireless buzz has been about the consumer market. But, as with the Web, it became apparent that the payoffs are in the B2B arena.
- IT already has most of the tools needed for business use of wireless. They can be a natural extension of existing core standards and platform architecture, most notably Windows and Ethernet, that robust and long-established base for LANs.

This is news that's being obscured by the mass-market frenzy. The initiatives involve bets on unproven standards, reliance on the telecom industry to deliver on its broadband promises and a search for the as-yet-unknown killer app.

The wireless Ethernet, based on the 802.11b networking specification, doesn't involve any of those. It's easy to install. Just in the past month, I've seen many high schools, small companies, universities and medical centers implement it quietly, simply and inexpensively. They saved money and added organizational mobility with minimal added complexity in IT operations.

For me, perhaps, the most important current component of the integration of wireless into the enterprise platform is the wearable computer. I recently started to use Xybernaut's Mobile Assistant, a full-function PC with a decent display that I can wear on my wrist and use as a touch screen. It comes with a wearable small keyboard or a full-size keyboard. The headset for dictation has a neat, small, mirrorlike add-on that displays the screen a few inches above my eye. Add a full-port replicator and access to all pocket radio, cellular and satellite communications, and here's why I see 802.11b and a Xybernaut/802.11b-enabled laptop as IT's current message about wireless:

- The main immediate payoff from wireless will come from productivity gains, especially in providing workers out in the field with full-function computing and communications. It may be years before consumer use of wireless Internet tools takes off. Grab the productivity now.
- The enterprise can use IT effectively only if all the access tools — from pocket to briefcase to desktop — are consistent in functions, standards, applications and interfaces. Build the platform, then extend the application. Without a platform standard and strategy now, enterprise wireless will be a game of guesswork for years. Given how truly dreadful even basic cell phone service is in the U.S., and the decadelong delay between development and large-scale rollout of DSL, it's almost certain that the path to wireless will be strewn with rocks. So bet on the proven platform base of Ethernet and Windows.

Soon, just about every innovation in Internet use will be wireless-centered.

Ethernet and Windows will make today's mass-market WAP tools and 3G secondary to businesses in exploiting wireless technology for enterprise opportunity. Satellite transmission will add wide-area data communication capability. At some point, newer technologies, including 3G, will usher in the wireless revolution.

But why wait? IT can only be a bystander in the wireless-for-the-masses game, yet it can and should be the leader in the wireless-for-enterprise-productivity game.

Keen is chairman of Keen Education, as well as an author and consultant. His Web site is www.peterkeen.com, *and he can be reached at peter@peterkeen.com.*

How business becomes e-business.™

The great e-business shakeout is well under way. For those who didn't make it, our condolences. At least the end was quick.

For those who have made it, who broke the code and figured out how to build a truly viable e-business, our heartiest congratulations.

As it turns out, many of these successful companies–including the majority of the Fortune e-50–have built their e-businesses on an exceptionally strong foundation.

The BEA WebLogic® E-Business Platform.™

This award-winning set of innovative software and services is uniquely designed to help businesses rapidly develop and launch advanced e-commerce initiatives. It's an end-to-end solution that includes rich personalization and complete B2B integration. In fact, it's now the global standard by which all e-commerce software is measured.

Which explains why it's BEA's market-leading platform that powers Chase Manhattan, FedEx, Amazon.com, United Airlines, Wells Fargo, E*TRADE and over 6,500 other successful e-businesses. Find out how we can help yours. Visit us at www.bea.com.

bea™

www.bea.com

©2000 BEA Systems, Inc. How business becomes e-business and BEA WebLogic E-Business Platform are trademarks and BEA and WebLogic are registered trademarks of BEA Systems, Inc.

Chief Privacy Officers: Forces? Or Figureheads?

Newly appointed overseers of data privacy must work with IT, but they may lack real authority. By Kim S. Nash

THE SUDDEN interest in appointing chief privacy officers (CPO) stems as much from fear as it does from the desire to protect customers.

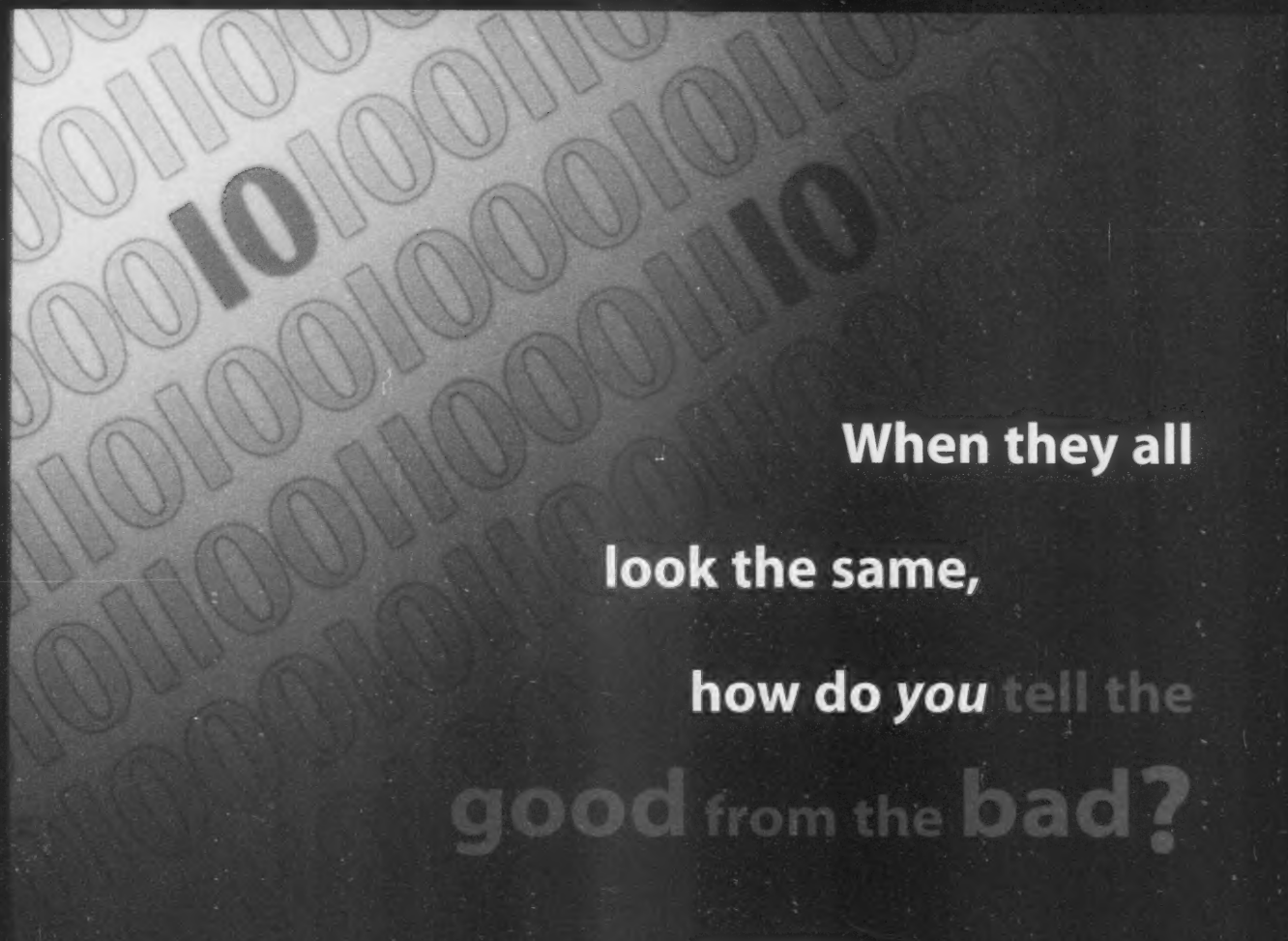
The CPO movement is young [Page One, Sept. 18]: About 50 to 75 companies have created such positions in the past several months, according to Alan Westin, a business privacy expert who in July started the Association of Corporate Privacy Officers (ACPO) in Hackensack, N.J.

Many more CPOs are expected to be hired as a result of the growing corporate angst over whether Congress will pass strict privacy laws that may hamper business. The Federal Trade Commission (FTC) has already suggested that corporate self-regulation isn't working [Business, June 19].

But having a CPO is fast becoming a

VERIZON COMMUNICATIONS Executive Director of Privacy Shelley Harms strives to balance privacy and profit

STEVE ROMAS



Captus Networks' unique solution allows service providers and net-centric enterprises to identify and dynamically shut down suspicious traffic or malicious attacks.

captus NETWORKS™

That's because Captus Networks detects and adaptively denies traffic from the source of these attacks whether originating from inside or outside the network.

Captus Networks integrates routing, adaptive firewalling, dynamic intrusion detection, and network load balancing into a single network security device.

www.captusnetworks.com/go

PROTECT YOUR STUFF

High-Speed Intrusion Protection for the Enterprise

Don't leave your Gigabit and fast Ethernet segments exposed to hackers and insiders.

Our award-winning intrusion protection products protect high-speed segments and servers better than anyone else in the game.

We deliver centrally managed agent- and network-based protection to every server or segment, desktop or notebook in the enterprise, inside or outside the firewall. The other guys can't.

Don't believe it? We can prove it.

www.networkice.com/cw-eval

©1998-2000 Network ICE Corporation. All rights reserved.

Ni Network ICE

Enterprise Intrusion Protection at the Speed of Light™

Continued from page 62

But having a CPO is fast becoming a checklist item to help companies ward off government regulation and to reassure customers that their privacy will be protected, says Jonathan Gaw, an analyst at International Data Corp. in San Mateo, Calif.

Often, a CPO is at a disadvantage from the start, Gaw says. "Companies are about making money," he says. "But CPOs don't have a budget. They are not responsible for profit and loss. They generally don't have large staffs relative to the rest of the company, and, of course, they don't bring in any revenue."

In general, no standard chain of command involving the CPO exists yet. At some companies, the CPO reports to the director of compliance; at others, he reports to the CEO. CPOs are former lawyers, marketing people and compliance officers. They may or may not have an information technology background, although experts say having an understanding of IT is key.

MEET THE CPO at CompuCredit Corp. in Atlanta. See Job Watch, PAGE 127

The job description varies, but, according to the ACPO, general duties include the following:

- Training employees about privacy.
- Comparing the company's privacy policies with potential risks and then figuring out whether or not and how to fill gaps.
- Managing a customer-privacy dispute and verification process.
- Informing senior executives on how the company deals with privacy issues.

Sometimes a CPO is named after a bad privacy incident threatens sales and profits.

For example, Minneapolis-based U.S. Bancorp, an $86 billion bank, appointed a CPO in August after spending $3 million to settle a lawsuit that accused the bank of selling confidential customer financial data to telemarketers. CPO Patricia Bauer reports to the president and chief operating officer.

DoubleClick Inc., an online advertising firm in New York, brought in a CPO after the FTC and several states started to investigate its data-sharing practices last winter. People had complained about DoubleClick's tracking of individual Web users by name and then matching the information to a marketing profile database. The company has since stepped back from that plan. DoubleClick appointed the CPO to oversee and educate the public about its privacy policies, the company said in a statement.

What separates a forceful CPO from a figurehead is whether that person can change or stop a marketing or IT project when privacy questions arise.

At AT&T Corp., for example, Mike Lamb, who was appointed CPO in June, recently had a hand in nixing a deal with a large consumer retail company to market AT&T's long-distance service.

The retailer insisted that it get full access to AT&T customer data, Lamb says. But that would have violated the phone company's vow to keep such information confidential unless the customer OK's its release.

"I got directly involved in the conversations [with the retailer]. I reinforced in the context of those negotiations that our commitment to privacy was nonnegotiable," Lamb says.

Sally Cowan, CPO at New York-based American Express Co., participated in the recent creation of single-use credit-card numbers for online shopping, a company spokeswoman says. At every step — from customer focus groups to development and implementation — Cowan made sure Amex's privacy policies explained how the so-called Private Payments service took shape before it was launched in September.

One warning sign that a CPO may be ineffective is when he has other job titles and responsibilities, says Jim Grady, an analyst at Giga Information Group Inc. in Cambridge, Mass.

When that happens, the CPO will likely be too busy to keep up with all the business, political and technical aspects of the privacy issue, Grady says.

Pat Carmody is a multitasking CPO at Mutual of Omaha Insurance Co. A lawyer by training, Carmody was appointed to lead privacy efforts four months ago. As CPO, he's overseeing a companywide audit of data flows to determine what happens to customer information as it moves through the Omaha-based insurer.

> The CPO's job is a combination of 50,000 feet and down in the dirt.
>
> SHELLEY HARMS, EXECUTIVE DIRECTOR OF PRIVACY, VERIZON COMMUNICATIONS

Yet Carmody's actual title is vice president of insurance department services. He's also in charge of making sure the insurer's many forms and rate structures comply with state and federal laws. But he maintains that despite his multiple roles, privacy is "an important mission" for the insurer. He plans to have three people working for him on privacy issues by year's end.

Still, a better strategy is to keep the CPO free of other duties, Grady says. "There's a new wrinkle to privacy every day. If you're responsible for several other areas, it'll be quite difficult to do the privacy part of the job well," he says.

The relationship between the CPO and the IT group is critical. Not only must a CPO understand IT security, but he should also be well-informed about how the IT group treats customer data as it pulses through the company's systems.

Proactive or Reactive?

Even when they go to the trouble of naming a CPO, not all companies insert that executive into IT processes. Often, for example, IT people aren't required to meet with the CPO when applications are being designed. Rather, the CPO is contacted only after privacy questions surface.

Some experts criticize this approach, saying it's easier and cheaper to fix potential problems early in a project rather than afterward.

Shelley Harms, executive director of privacy at New York-based Verizon Communications, says that although she isn't a checklist item on the IT group's agenda during new projects, she regularly talks with technology managers in each business unit. "So if a crisis comes up, we have that relationship," she says.

That's just what happened this summer, when a form on Verizon's Web site that lets customers place repair orders inadvertently exposed account information. When Verizon found out about it, IT shut down the application to fix it while Harms offered advice on how to route the account information so it wouldn't be revealed online. She also worked with IT on a postmortem study of what went wrong and how to avoid making the same mistakes in the future. But even when a company has a formal privacy policy, employees may disagree about how to interpret it. That's when the CPO must referee.

Harms recently mediated when internal marketing staffers questioned which Verizon pledge should take precedence: the company's vow to honor customer requests not to receive marketing mailings or a promise to give customers better alternatives to their current long-distance programs. "We debated, and we decided that telling somebody that his service has become cheaper or that tweaking it in this manner will make it cheaper isn't a solicitation," Harms says.

Overall, she says, she must consider philosophical issues about how to protect customer privacy while the company earns a profit. But she also has to dig into technology issues such as how best to combine Verizon's various "do not call" customer opt-out lists into a single Oracle Corp. database.

"The CPO's job," she says, "is a combination of 50,000 feet and down in the dirt." ◗

Warding Off Washington?

CORPORATE AMERICA is desperate to convince the public that it can be trusted with private consumer information.

Otherwise, pundits say, Congress will likely enact privacy laws that will force many businesses to change the way they handle data. Several such bills are pending and are expected to be debated next year.

The appointment of CPOs is just one small move companies are taking. And *small* is the operative word, says Jonathan Gaw, an analyst at IDC.

"In an organization where everybody is focused on making money, you need someone to wave the consumer flag. CPOs are necessary in that regard, but [they're] not enough," Gaw says.

Other recent corporate steps to establish and maintain consumer trust include:

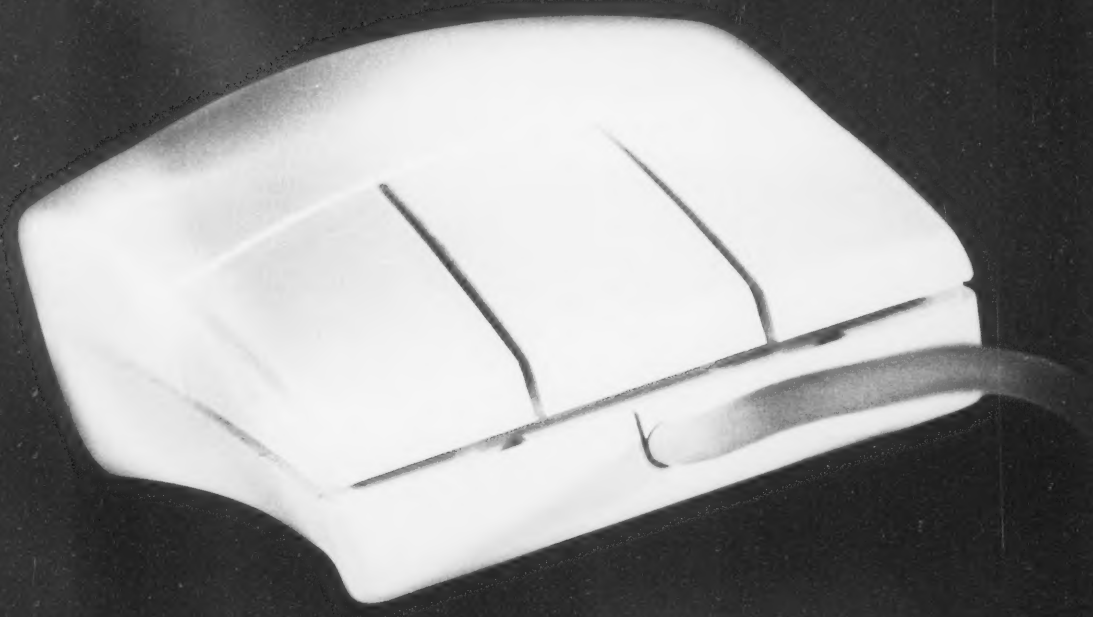
- The ACPO (*www.pandab.org*), a professional group for CPOs, was created in July.
- Nine of the biggest online advertising firms signed a deal with the federal government in August to limit the kind of information they collect from Web surfers without the users' consent.
- In June, 24 companies and trade associations formed the Privacy Leadership Initiative, an alliance to study consumer privacy issues and lay out voluntary guidelines. The group announced last month that it will work with the New York-based Direct Marketing Association on a three-year, multimillion-dollar publicity blitz to convince consumers that their data is safe.

– *Kim S. Nash*

MOREONLINE

Take a Quick Poll this week on privacy at **www.computerworld.com.**

Enter our web site
via the internet...



Precision Air
AC Power
DC Power
Site Monitoring
TVSS

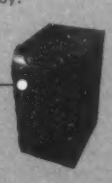
If you'd like a chance at winning the hottest ride in decades, then you'll need to step on the gas and enter our sweepstakes at win.liebert.com. When you visit our site you'll learn why Liebert is the most reliable name in critical systems protection and you'll get a shot at winning a PT Cruiser.

Register today, so the PT Cruiser (or one of 5,000 other prizes) doesn't pass you by!

2nd Prize

2nd Prize – *Nfinity*® UPS (4 – 16 kVA)

The modular design allows you to configure the *Nfinity* UPS to match your changing power needs. You'll find redundancy and intelligence features in the power and battery modules, power bypass systems, communication paths, and system controls.



...and you could exit

via the interstate.

Enter our sweepstakes today...you could win a Chrysler PT Cruiser! You'll also learn how Liebert can help shift your critical systems protection to "continuous availability".

3rd Prize

3rd Prize – The Foundation™ Mini Computer Room
It offers comprehensive critical system protection by integrating power protection, environmental conditioning, and site monitoring – all the robust features of a computer room. Includes a variety of storage and protection options.

The prizes don't stop there...over 5,000 other sweepstakes rewards are up for grabs at: **win.liebert.com**.
No purchase necessary to win.

800-877-9222 dept. WIN

win.liebert.com

info@liebert.com

Liebert®
KEEPING BUSINESS IN BUSINESS®

© 2000 Liebert Corporation. All rights reserved throughout the world. Specifications subject to change without notice.
All names referred to are trademarks or registered trademarks of their respective owners.

BEWARE OF PRIVACY TRAPS

You can learn valuable lessons from three recent online privacy controversies. By Ann Harrison

DOES YOUR organization want to create responsible electronic privacy policies and to know when to anticipate controversy? You may want to pay close attention when other businesses are accused of mishandling consumer data. Three recent cases offer useful lessons about the types of products and services that attract criticism from privacy activists.

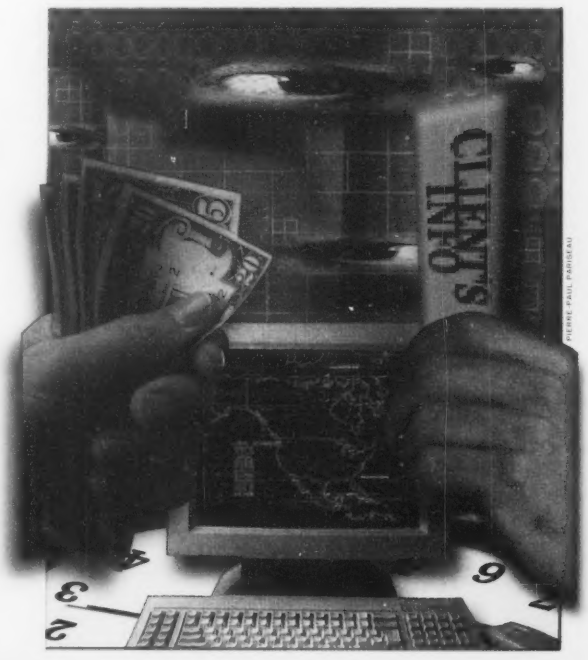
1 Be Careful With Unique ID Numbers

This summer, Digital:Convergence Corp. in Dallas was criticized for its use of a unique identification number embedded in hundreds of thousands of free :CueCat bar-code scanners shipped by the company and its partners.

The scanner, promoted as an easy way for consumers to visit Web sites by scanning printed bar codes, was revealed to contain a tracking feature created by the unique ID number. The tracking feature sent information back to the company. Digital:Convergence acknowledged the existence of the ID number but said its database breaks the connection between the ID number and personal data.

Privacy advocates argued that

See Privacy Traps, page 70



PIERRE-PAUL PARISEAU

DON'T LET THE SYSTEM BRING YOU DOWN. STUDENTS AT MIAMI-DADE COMMUNITY COLLEGE WERE BUMMED OUT BECAUSE THEY COULDN'T ACCESS MAINFRAME AND ORACLE8I DATA OVER THE WEB. THEN SAGAVISTA HELPED THE DATA GET OVER ITS HANGUPS IN A FAR-OUT 21 DAYS BY INTEGRATING STUDENT SERVICES AND SIMPLIFYING THE REGISTRATION PROCESS WHILE REDUCING IMPLEMENTATION COSTS. THIS SOLUTION WAS SO HAPPENING, CMP GAVE IT A 'REALWARE' AWARD. ATTAIN PEACE BETWEEN YOUR SYSTEMS, PEACE FOR YOUR I.T. STAFF, AND PEACE OF MIND FOR YOURSELF. ACHIEVE TOTAL E-LIGHTENMENT.

TO LEARN MORE ABOUT THIS IMPLEMENTATION, VISIT US AT WWW.SAGASOFTWARE.COM/HEAVYCW

© SAGA SOFTWARE, Inc., 2000. All rights reserved. SAGA, SAGA SOFTWARE, Sagavista, the SAGA and Sagavista logos and Enabling the E-conomy are trademarks of SAGA in the U.S. and other countries.

sagavista

Enabling the E-conomy™ through Enterprise Integration

REAL Awards

WINNER OF THE PRESTIGIOUS CMP 'REALWARE' AWARD FOR BEST EAI IMPLEMENTATION

SAGA

BEWARE OF PRIVACY TRAPS

Continued from page 68

:CueCat's tracking ability wasn't disclosed in the company's privacy policy, which also didn't indicate what the company does with the collected information. To make matters worse, an attacker broke into one of Digital:Convergence's Web servers and gained access to the registration information of some 146,000 users, then posted some of that information on the Internet. The company is now sending out notification of patent infringement letters to developers who are producing alternate versions of the :CueCat software without the ID number.

The Denver-based Privacy Foundation sought the following remedies from Digital:Convergence: Modify the software to remove the potential for tracking, provide a patch that disables the ID number for current users and notify users of the patch and the product's tracking potential. The foundation also suggested that future shipments of :CueCat have the user ID number disabled and disclose what information is collected through the device and how it will be used.

Doug Davis, chief technology officer at Digital:Convergence, says the company won't comply with these requests and has done an adequate job of disclosure. "There has been a lot of smoke and fire around privacy issues because we don't do what we could do," he says. "We are all about disclosing what we do and being extremely honest about that."

Davis says eliminating the ID number would seriously undermine the company's business model. Although he couldn't disclose what the company eventually plans to do with the information, he noted that it could permit end-to-end identity verification for Web transactions.

Davis' advice for other companies that wish to follow good privacy policies: "Be scrupulously honest about what you are doing, and be prepared to back that up."

> Everyone should have the right to tell a company or the company's receiver to destroy their data, and there should be a legal requirement to comply.
>
> **JASON CATLETT, EXECUTIVE DIRECTOR, JUNKBUSTERS CORP.**

2 Don't Offer Customer Data in a Fire Sale

Waltham, Mass.-based Toysmart.com Inc. caused an uproar recently when it tried to sell its customer data in bankruptcy proceedings. Although Toysmart had assured customers that their information would stay private, it reportedly put up for sale 250,000 names, addresses, billing information, credit-card numbers, shopping-behavior information and family profiles.

The Federal Trade Commission (FTC) and 39 states sued. The FTC approved a settlement allowing Toysmart to sell the information to a buyer who would agree to its privacy promises, but a federal bankruptcy judge rejected the agreement.

Jason Catlett, executive director of the privacy advocate group Junkbusters Corp. in Green Brook, N.J., argues that in such a case, consumers should have been given an "opt-in" agreement that requires their consent, because they may have their information sold against their wishes if their e-mail addresses aren't valid.

"Everyone should have the right to tell a company or the company's receiver to destroy their data, and there should be a legal requirement to comply," says Catlett, who supports a comprehensive federal privacy law that prevents personal or transaction data collected for one purpose to be used for another without consent.

3 Don't Weaken Privacy Policies

Privacy advocates were aghast when Seattle-based Amazon.com Inc. announced in September that it was removing an option in its privacy policy that let customers tell Amazon to never sell or share personal information.

While Amazon says it doesn't engage in this practice, the company acknowledged that it may opt to release this information in the future. If Amazon goes bankrupt or sells part or all of the company, it says it will sell all personal information it has collected. The company also revealed that it buys information about its customers from other sources and adds the data to its profiles, but it doesn't let people see the information it keeps about them.

Despite past statements on Amazon's Web site that "we do not now sell or rent our list of customers to anyone," Amazon spokesman Bill Curry told the IDG News Service in September that the company never guaranteed that it would forever ban the sale of customer data.

Amazon spokeswoman Patty Smith even claimed that the new policy is "stricter" because it spells out the conditions under which personal information can be transferred.

But privacy activists note that under the old policy, customers at least had the option of never having their information sold. Under the new policy, they don't have that option. Simply being more explicit about a bad and changeable policy isn't an improvement, according to Catlett.

Andrew Shen, a policy analyst at the Washington-based Electronic Privacy Information Center, says changing privacy policies will seriously erode customer trust.

"Consumers just want a clear answer about what will be done with the data — stay away from vague provisions," Shen says. "All companies should be expected to stick to their policies at all times."

Harrison is a former Computerworld *reporter. She is now a San Francisco-based freelance writer.*

Kane Border Patrol™

Kane Security Analyst™

Kane Secure Enterprise™

SecureNet Pro™

SecureCom™

for a .com world™

SecureNet Pro detects hidden hacker attacks other solutions can't.

SecureNet Pro™ is more than a network "sniffer." With advanced techniques such as TCP/IP reconstruction, fast network grep, and a vast network signature base, SecureNet Pro is state-of-the-art network intrusion detection for defeating hidden hacker attacks. Want more information? Find it at www.intrusion.com/snp;

or call toll free at 1-888-637-7770.

Security solutions for a .com world

© Copyright 2000 Intrusion.com, Inc. All rights reserved. Kane Security Analyst is a registered trademark of Intrusion.com. Kane Border Patrol, Kane Secure Enterprise, SecureNet Pro and SecureCom are trademarks of Intrusion.com, Inc.

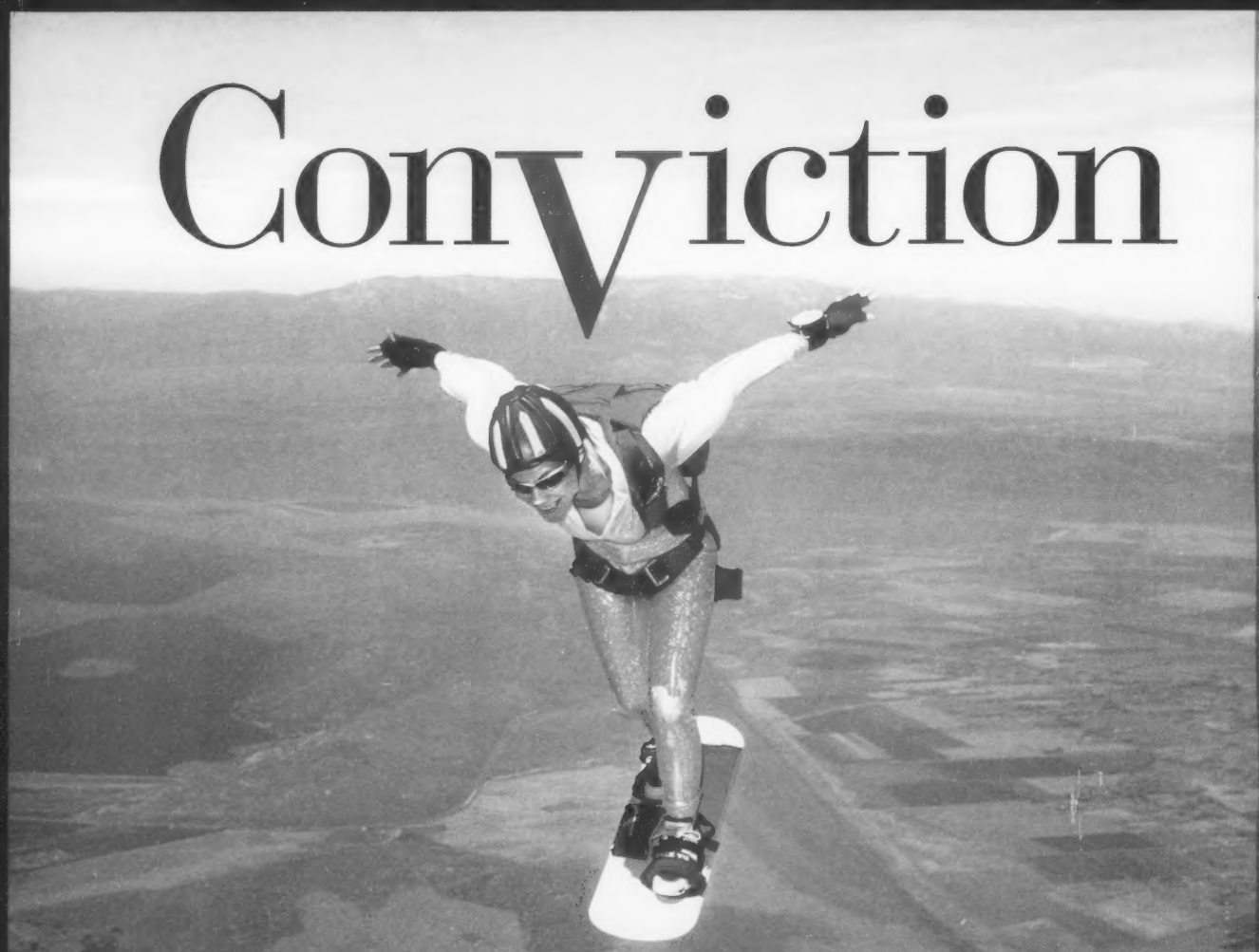
INTERNET JOB BOARDS
JANE JOBHUNTER
JOE JOBHUNTER
JANE JOBHUNTER
JOE JOBHUNTER
JANE JOBHUNTER
JOE JOBHUNTER
Other websites post your resumé.
We put it into the right hands.
thingamajob.com™
[LIFE 2.0 BEGINS HERE]
Connect with your own confidential career counselor at COMDEX booth L5019 Nov. 13-17

An Editorial Supplement to
COMPUTERWORLD
NOVEMBER 13, 2000

EMERGING COMPANIES 2001

100 COMPANIES TO WATCH

Conviction



VERITAS NetBackup™ keeps Exodus® soaring. It can do the same for you.

With VERITAS NetBackup, the sky's the limit.

"As the leading provider of Internet hosting for enterprises, we, at Exodus, must protect our clients' business critical data 24x7. VERITAS NetBackup provides a data center strength backup solution scalable to meet our customers' requirements. We rely on NetBackup to ensure our customers a level of data protection that today's mission critical applications demand."

Sam S. Mohamad, President Worldwide Sales & International Field Operations, Exodus Communications

For more information on the #1 UNIX backup product in the world, visit www.veritas.com/netbackup

VERITAS™
BUSINESS WITHOUT INTERRUPTION™

1-800-729-7894 code 86714L | www.veritas.com

EXODUS®

Copyright © 2000 VERITAS Software Corporation. All rights reserved. VERITAS, the VERITAS logo, and NetBackup are trademarks or registered trademarks of VERITAS Software Corporation or its affiliates in the U.S. and other countries. Other product names mentioned herein may be trademarks or registered trademarks of their respective companies.

Editors
Ellen Fanning
Robert L. Mitchell
Melissa Solomon

Managing Editor
Jean Consilvio

Art Director
Mitchell J. Hayes

Research Associate
Allison Wright

Writers
Steve Alexander
Pimm Fox
Mark Hall
Frank Hayes
Russell Kay
Julia King
Kathleen Melymuka
Deborah Radcliff

Copy Editors
Jacqueline Day
Eugene Demaître
Jamie Eckle
Linda Frank
Michele Lee
Michael Parent
Bob Rawson
Monica Sambataro

Design Director
Stephanie Faucher

Computerworld Editor in Chief
Maryfran Johnson

Computerworld Editorial Director
Patricia Keefe

Computerworld Review Panel
Gary H. Anthes
Mitch Betts
Lorraine Cosgrove
Kevin Fogarty
Pimm Fox
Mark Hall
Frank Hayes
Maryfran Johnson
Russell Kay
Robert L. Mitchell
Robert L. Scheier
Melissa Solomon

From The Editors

YOU FEELING LUCKY TODAY? Feeling like you want to break out of the box and buy some software or a service from a new company that seems to have a great idea, but no proven track record? You know, take a *risk*?

Well, hold that thought. And read on.

In the following pages, you'll read sage advice from your colleagues who have gambled on an emerging company. Most say they did take risks, but they liked the rewards. These early users say start-ups often will change their software to meet customer needs and will make doubly sure security holes are plugged before they ship their products. A bigger company isn't always a better company, they say. Start-ups move light and fast and can keep pace with a changing business landscape, these customers say.

They also say, *You're putting your business in their hands.*

You're not just choosing a vendor, you're choosing a business partner. So it's not enough to have the courage to take the risk. You need to test the waters, really test the waters, first. In other words, how do you reduce the risk? Your fellow IT managers offer this advice: Do what the venture capitalists do and follow the money. Look for solid investors and strategic partners. Interview past customers. Tie payments to accomplished goals.

Computerworld's Emerging Companies to Watch in 2001 is our list of new companies we think are worth putting to the test. We've chosen our winners from 10 key technology areas. *Computerworld*'s editors reviewed the initial group of nominees, and a panel of industry experts helped us narrow the list to the Top 100. No one has a crystal ball for these things, but these companies look like winners to us.

At the very least, if you take a gamble on an emerging company, we hope the reward is worth the risk.

Ellen Fanning
Robert L. Mitchell
Melissa Solomon

Copyright 2000 by Computerworld Inc. All rights reserved. Computerworld can be purchased on 35mm microfilm through University Microfilms Inc. Periodical Entry Dept., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Photocopy rights: Permission to photocopy for internal or personal use of specific clients is granted by Computerworld Inc. for libraries and other users registered with the Copyright Clearance Center, provided that the base fee of $3 per copy of the article, plus 50 cents per page, is paid directly to Copyright Clearance Center, 27 Congress St., Salem, Mass. 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Ray Trynovich, Reprint Management Services, P.O. Box 5363, Lancaster, Pa. 17606-5363; (717) 560-2001, Ext. 24. For subscriptions, call toll-free (800) 669-1002. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $4 per copy; U.S. - $48 per year; Canada - $110 per year; Central and So. America - $150 per year; Europe and all other countries - $295 per year (airmail service).

Contents

4 **Smoke and Mirrors**
Separating hype from reality is key to picking an e-business vendor.
By Kathleen Melymuka

10 **Who Can You Trust?**
As competition builds, a growing number of online B2B marketplaces are scrambling to survive by adding services that reduce the risk of anonymity.
By Julia King

12 **Picking a Winner**
As the first investors in an emerging company, venture capitalists scrutinize every aspect of a firm before spending a dime. Here's what VC firms look for when placing their bets.
By Pimm Fox

14 **ASPs In the Catbird Seat**
Outsourcing has made hosted software a hot market for start-ups and has put these new ASPs in the limelight with venture capitalists.
By Mark Hall

17 **Mind Your Markets**
Industry experts take a look at what our Emerging Companies need to do battle in their markets.
By Pimm Fox

21 **Speeding the Web**
Caching tools from emerging companies can crank up your Web business.
By Russell Kay

22 **Overcoming Software Volatilities**
Installing the latest software on your network? Take it from the pros: No new program is entirely risk-free.
By Deborah Radcliff

24 **Big Risks. Even Bigger Rewards**
Sure, there's risk. But customers of software start-ups say the payoff is dramatic.
By Steve Alexander

28 **100 Emerging Companies to Watch**
The methodology, the review panel, *the list*.

34 **Frankly Speaking**
Columnist Frank Hayes on how to choose an emerging company survivor.

Smoke and

»» Separating hype from reality is key to picking an e-business vendor.

By KATHLEEN MELYMUKA

David Scholtz recalls hearing about a start-up that had secured its first round of funding and selected an e-business vendor. The vendor proposed the right technologies, but it lacked experience in working with them and lost precious time in trial and error. As a result, the start-up's product was three months late. That bump delayed the second round of funding and shook investor confidence. Money began to dry up, and the start-up company eventually folded.

"The vendor partner was learning along the way and making mistakes, and the company paid the price for it," says Scholtz, CEO and founder of AllCharities.com Corp. in San Francisco. Scholtz has fared better with his e-business vendors than the ill-fated start-up, but he knows the dangers. When you deal with an e-business vendor, he warns, "you're putting your business in their hands."

New e-business vendors are popping up faster than mushrooms after a rain (the e-commerce segment of our Emerging Companies list contains 18 of the hottest up-and-coming companies), and each promises to turn your company into an e-business player overnight. But while some can improve the health of your company, others are poison. How can you tell the portobellos from the toadstools in this strange new world?

MELANIE MASON at CenterBeam: "We had a short-term need to get our Web site up and running, but [our vendor] really wanted to do what was cool to them"

d Mirrors

JOHN HARDING PHOTOS

THE RIGHT PERSPECTIVE

First of all, you need the right perspective, says Tom Bugnitz, managing director of The e-Business Forum and president of consulting firm The Beta Group, both in St. Louis. "People say, 'How do I make my business an e-business?' not, 'What is it that I'm going to be doing for my customers in a couple years, and how will e-business enable that?' " he says.

In addition to customer issues, you need to consider how much change and uncertainty your company can handle. You need to know whether you're going to be a benchmarker or an innovator. A benchmarker asks, "Who's good in my sector, and how can I copy them?" explains John Jordan, director for e-commerce research at Cap Gemini Ernst & Young in Cambridge, Mass. He favors the innovator mentality, which breaks from the pack. But that's a hard road, he says, "because you have to go someplace no one has been before."

Don't make the mistake of thinking of e-business as an easy way out of problems with your supply chain or other corporate processes, says Jeff Hemmer, vice president of customer supply chain at Lyondell Chemical Co. in Houston. Lyondell is completing an e-business project with Houston-based ECOutlook.com, one of *Computerworld's* Emerging Companies winners, to improve connectivity and integration with remote inventory locations. "Often, people look for vendors to fix their problems, but they won't," he says. "If you have a fundamental problem, you fix it first."

Having an e-business strategy is a long way from just putting up a Web site, says Philip Anderson, director of the Glassmeyer/McNamee Center for Digital Strategies at the Tuck School of Business at Dartmouth College in Hanover, N.H. "If you end up just webifying the current way you do business, you're better off doing nothing," he says. Instead, he explains, think about what you're really trying to accomplish.

Melanie Mason, vice president of marketing at CenterBeam Inc., a technology service provider in Santa Clara, Calif., considered how her company viewed its business in relation to the Internet, how its customers and prospects were using the Internet and what its Web site should do for customers. Then she took the conversation to key stakeholders throughout the company and built an e-business strategy with a short-term goal of creating a number of internally and externally focused Web sites and a long-term goal of using them to establish and nurture customer communities.

KEEP IT SIMPLE

Your strategy can be simple, says Anderson. But before you even begin to discuss your plans with vendors, you must know how your company will alter the dimensions of your industry in your favor in the next one to three years. You may, for example, plan to deliver a level of convenience the industry has never seen. You may plan to make it easier to do business than anyone else in the industry or take huge amounts of risk out of doing business in your space. Whatever your strategy, he says, "if you don't have one, you're not ready to sit down with anybody."

View vendor selection as a business issue, not a technology issue, Bugnitz says. "You're not choosing a technology vendor," he says. "You're choosing somebody who's going to be implementing a very significant part of your business strategy."

To prepare for that, find a systems integrator that can give you a crash course on the nuts and bolts of e-business, says Anderson. Then use the integrator as an adviser during your vendor selection. "You need a personal shopper who can walk you through the landscape, through the alternatives, who knows who's credible as a company," Bugnitz says. "You want to be able to say, 'This sounds neat. Who else can do that?' "

> **If you end up just webifying the current way you do business, you're better off doing nothing.**
>
> –PHILIP ANDERSON, TUCK SCHOOL OF BUSINESS, DARTMOUTH COLLEGE

Scholtz, who is working with e-business site developer Groundswell Inc. in San Francisco, also an Emerging Companies winner, adds that someone on your company's team should "absolutely" have experience on the vendor side of the business. "I came from that side, so I knew the questions to ask and the things to look for," he says.

ASK QUESTIONS

Ask prospective vendors the traditional questions — look at their financials and interview past customers. Look for proof that the vendor can support the specific technology it's proposing and the scale of the project. Ask for commitments of specific people to work on the job, examine their résumés and interview the key people, looking for both knowledge and a cultural fit.

Beyond that, Hemmer says, look at how fast the vendor itself is retooling for new opportunities. "That shows their adaptability and flexibility," he says.

Determine how well the corporate cultures, strategies, work habits and relationships align. "It's not about technology; it's about business," Hemmer says. "This sounds touchy-feely, but these things are so hard to do. If you don't have [compatibility] up front, you'll have a lot of problems."

Mason says some vendors have hidden agendas that can take on a life of their own as a project moves ahead. She suggests that you look at previous work done by the vendor to see how the initial strategy compares with the product that was delivered. To the extent that the two differ, the vendor may have been steering the project without the customer's knowledge of it.

CENTERBEAM'S MELANIE MASON: Look at a vendor's track record to ensure that they deliver what the customer wants

Rick Ehrensaft, director of marketing at distribution services firm Pentacon Inc. in Houston, was planning a complex, Web-based, just-in-time product delivery system. He asked vendor candidates if they were prepared not just to build the project but also to implement it, handling pieces such as establishing supplier and customer connections. "We didn't want to be experts in this," says Ehrensaft.

Bugnitz takes managing a project a step further. "What's their commitment to helping me adjust after we get things up and running?" he says. "What are they going to do to hold my hand beyond the time we've implemented? Can they really help me take that next step?"

In fact, Anderson says, the best e-business vendors are willing to be outsourcing partners. "They will run it," he says. "The vendors who can provide outsourced solutions are going to be the big winners among all these firms."

Don't say, "Brief us on what your software does," Anderson says. Instead, tell the vendor what you're attempting to do and then ask what's the best way to accomplish it. Only then should you ask how the vendor's software fits into the picture.

"You can assume they all overpromise and underdeliver," says David Bergen, CIO at CarStation.com in San Francisco, who used a transitional e-business vendor to get his business-to-business auto industry exchange on its feet while building his own Web development team.

To discern between hype and reality, Hemmer says he talks to as many people at as many levels of the vendor firm as he can. "I see if I'm getting the same answers from everybody," he says.

Hemmer says he sees a red flag if a vendor is slow to produce customers to talk to, and he balks at a proposal based on a solution that isn't quite finished.

"Look carefully at that demo, and figure out if it's smoke and mirrors or [if] it's really there," he advises.

Scholtz says to take note if you don't meet key project staff during the sales pitch. "If the vendor professes to have the ideal project lead to match your project, then I would like to have that person involved in the early discussions," he says.

Anderson says you need an honest sense of where your company fits in the vendor's big picture and whether it can guarantee who will be working with you. "It's a mistake to think you're working with Firm X," he says. "You're working with People A, B and C."

LEAPING THE PITS

Customers agree that e-business projects come with some unique pitfalls. One of the biggest is dueling agendas. "These [vendors] are not hurting for business, and they take you on because of what you offer them," says Mason.

She found that her vendor was much more intrigued by her long-term goal than her less sexy short-term priorities. "We had a short-term need to get our Web site up and running, but they really wanted to do what was cool to them," she recalls. "There were hiccups in the beginning around this."

"The key is to understand what you really want to do and not get sucked into what they want to do," says Lyondell's Hemmer. "You have to lead them; don't let them lead you."

Because so many e-commerce vendors are new businesses, you have to be convinced that your vendor will survive, says Hemmer. Even so, with the world changing at Internet speed, you don't want to get into a long-term contract. "If they don't evolve fast enough, they could be obsolete next year," he explains.

Keep your options open by making the initial term very short, he advises. Then renegotiate. "Even if I have to pay more up front, I'll sacrifice that for flexibility," Hemmer says.

Problems arise when the customer abdicates responsibility because it's easier to let the vendor decide, Bugnitz says. Then, when the project is finished, it doesn't look the way the user thought it would.

Similarly, some customers allow a vendor to use technology that doesn't align well with existing technology. "It can happen if you think of e-commerce as an isolated, separate piece," Bugnitz says.

In both cases, the mistake is in failing to realize that e-business is an integral part of the entire business.

WORDS TO THE WISE

Although working with and emerging e-commerce vendor brings a new set of challenges, there are areas where you can leverage the relationship. "For many younger companies, one big account legitimates them," says Anderson. If your company is large enough to play the role of that key reference customer, "they will move heaven and earth to please you," he explains.

But if you're a midsize company, he adds, all bets are off. "If there's a crunch on a project for Boeing, you're not going to be in the front seat of the movie theater," Anderson says.

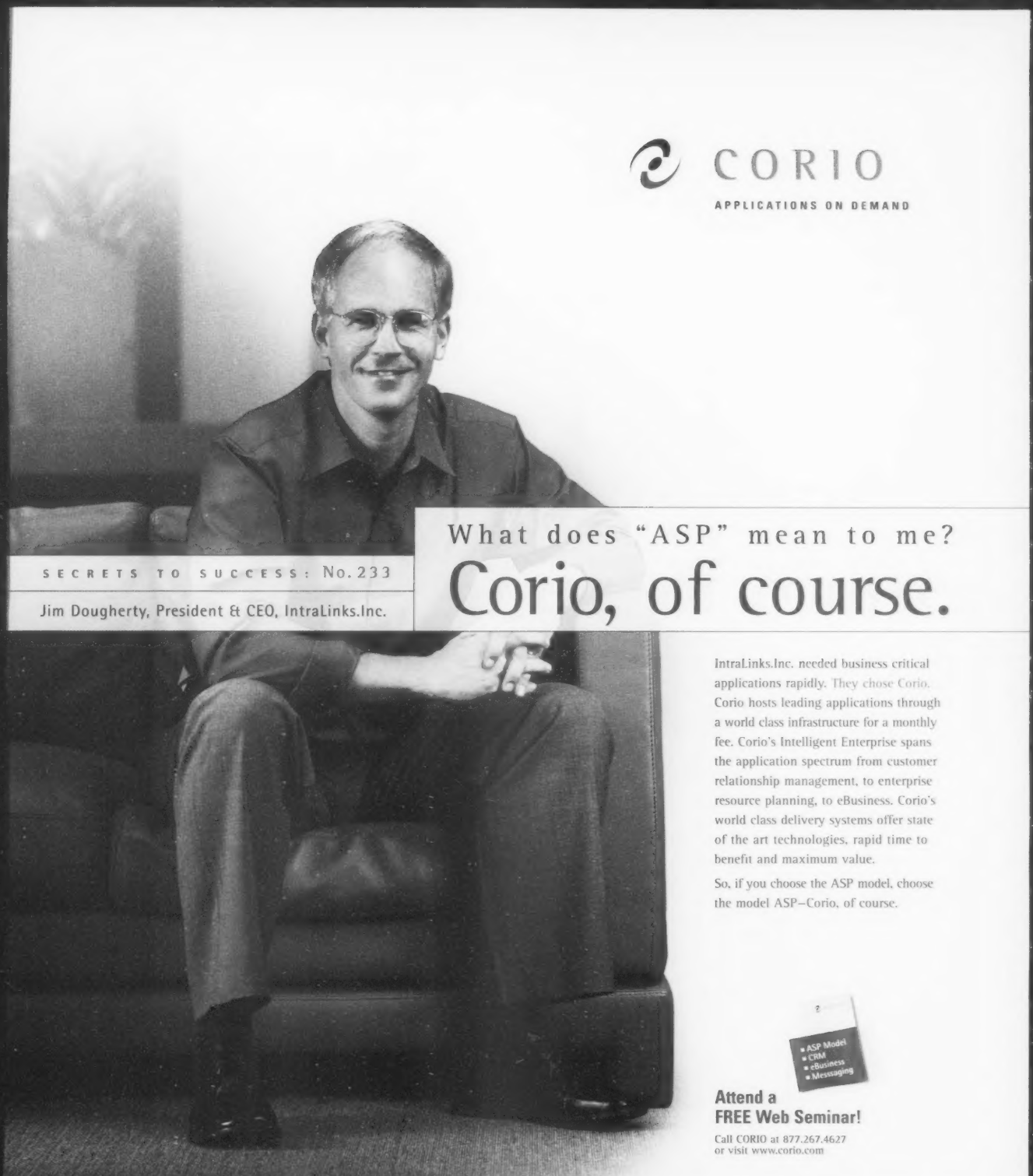
With that in mind, he agrees that modular projects with short deadlines are the way to go. "If you take on a big project of eight to 10 months' duration, you're asking to be screwed," he says.

This strategy dovetails with what Mason says is the most important lesson she has learned about e-business.

"No one firm can do it all," she says. "Some are good at one thing and some at another. You don't want to force-fit them. Be smart about it, and use the companies for what they're best at."

Ten Questions to Answer Before Signing an E-Commerce Vendor

- Is your company a benchmarker or an innovator at heart?
- What are your customers' needs and how will electronic business address them?
- What is your e-commerce strategy?
- Are people throughout the company ready to change the way they work to make your Web-based business a reality?
- Will the e-commerce venture be one large project or will you start small and build incrementally?
- Will you look for one vendor or several best-of-breed partners?
- Are you expecting an e-commerce vendor to fix problems with your business processes?
- By what criteria will you judge vendor candidates?
- Do you have a good enough feel for the nuts and bolts of online business to hold your own among vendors and not get lost in the complexity?
- Does your team include someone with a vendor background?



CORIO

APPLICATIONS ON DEMAND

SECRETS TO SUCCESS: No. 233

Jim Dougherty, President & CEO, IntraLinks.Inc.

What does "ASP" mean to me?

Corio, of course.

IntraLinks.Inc. needed business critical applications rapidly. They chose Corio. Corio hosts leading applications through a world class infrastructure for a monthly fee. Corio's Intelligent Enterprise spans the application spectrum from customer relationship management, to enterprise resource planning, to eBusiness. Corio's world class delivery systems offer state of the art technologies, rapid time to benefit and maximum value.

So, if you choose the ASP model, choose the model ASP–Corio, of course.

Attend a FREE Web Seminar!

Call CORIO at 877.267.4627
or visit www.corio.com

BroadVision COMMERCE ONE. Microsoft MOAI PEOPLESOFT SAP SIEBEL Sun

© 2000 Corio, Inc. All rights reserved. All other company and product names are trademarks of their respective owners.

It's now standard practice
to depend on Web Applications.

Now it's time for an industry standard to manage them.

Let's face it. You have to be on the leading edge of what has become known as e-business. But you cannot afford to lose sales, customers and brand reputation because of failed transactions. So your systems must be more than excellent. They must be failsafe.

Relax. Tonic has arrived.

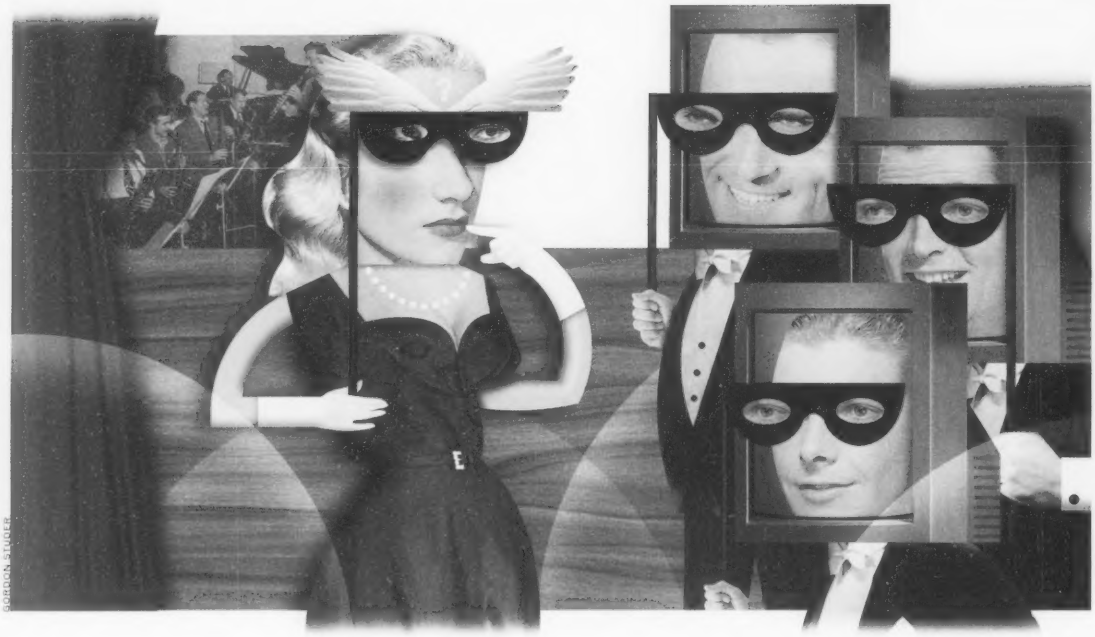
Now you can feel comfortable about your company's dependence on web applications. Because the Tonic enterprise solution heralds a new era of web applications management.

Load testing and integrity assessment before going live. And on-going monitoring of systems beyond anything previously offered by a single company. That's Tonic.

Active within hours, not days. Easy to use with no retrofitting of your systems required. But with the scalability to simulate millions, not just thousands, of simultaneous users. After all, you plan to be that successful, right?

Suddenly the leading edge is a much more comfortable place to be.
www.tonic.com

TONIC™ Guaranteeing Your Net Works.™



»» As competition builds, a growing number of online B2B marketplaces are scrambling to survive by adding services that reduce the risk of anonymity. By JULIA KING

Ask Tom Stephens, executive vice president at Paschall Truck Lines Inc., about doing business on Internet marketplaces, and he'll tell you about the Los Angeles-to-Florida-bound load that his firm never got paid for hauling.

The $132 million Murray, Ky.-based transport company "won" the new business on Netfreight.com, a now-defunct electronic marketplace whose Web site matched shippers with lowest-bid carriers.

"We picked up the load, delivered it and we billed the customer that Netfreight said to bill," Stephens recalls. "But the customer said the bill wasn't theirs."

To resolve the problem, Paschall went back to the marketplace, but Netfreight was out of business, and he was out several thousand dollars.

"It's a headache not knowing who the customer really is," Stephens says. Still, he adds, the Netfreight encounter hasn't soured him on online marketplaces.

"We'll do it again, but we'll become much more selective about who we deal with," he says.

Paschall's experience goes straight to the Achilles' heel of online marketplaces — the absence of trust.

It's true that electronic marketplaces provide a fast, inexpensive and relatively easy way to introduce buyers to a whole new universe of suppliers, and vice versa. But in most cases, there's no guarantee those newfound contacts will make for good business partners who will deliver quality goods or pay their bills on time.

That's one of the factors driving the proliferation of private digital exchanges, which electronically link a deliberately reduced number of key suppliers. Gartner Group Inc. in Stamford, Conn., estimates that some 30,000 private exchanges are in various stages of development, compared with some 600 public exchanges.

But several of *Computerworld*'s Emerging Companies are introducing technology aimed at addressing security concerns and providing services to lure buyers to public marketplaces.

"To bring real value in an electronic marketplace, you have to offer more than just a place to shop," says Marty Gruhn, an analyst at Summit Strategies Inc. in Boston. "The future for marketplaces will be offering services customers will pay for — things like escrow services, currency translation, credit and logistics services. The marketplace business isn't a transactions business. It's a services business."

SOPHISTICATED SERVICES

Increasingly, public marketplaces seem to be heeding that message, adding services ranging from identity and credit verifications to field inspection of goods bought and sold sight unseen at electronic marketplaces.

Consider RetailExchange.com, a Boston-based electronic marketplace that links manufacturers and retailers. The exchange prequalifies buyers and sellers then matches them, but not via the traditional auction method. Instead, RetailExchange.com provides negotiation and channel management services that, among other things, establish up front the identity and creditworthiness of all parties.

For example, manufacturers can use the channel management service to stipulate which retailers to include in online negotiations for particular goods.

"The last thing a Tommy Hilfiger, which is selling their fall line through department stores, wants to see is the excess from the same line showing up two blocks away at a discount loft, so we have features to control their channels," explains Melissa Webster, vice president of strategic partnerships at RetailExchange.com. "It's critical to our value proposition — especially to sellers — to identify our members."

RetailExchange.com, which has 4,500 members and has traded about $20 million in goods since its launch in February, also offers credit protection to sellers through a partnership with New York-based CIT Commercial Services Group Inc. For an extra

Who Can You Trust?

fee, CIT essentially buys a seller's accounts receivables, guaranteeing to pay the seller if an online buyer doesn't pay up.

Round Rock, Texas-based Dell Computer Corp.'s newly launched electronic marketplace, Dellmarketplace.com, goes a step beyond identifying buyers. It uses software embedded in the Dell marketplace to let suppliers differentiate how they market and sell their products to various buyers. The software is from Austin, Texas-based Exterprise Inc., an Emerging Companies winner.

For example, an electronics supplier selling projectors on the exchange might feature product benefits such as "lightweight" and "high image quality" for a less-sophisticated buyer but display all of the technical specifications for a buyer who identifies himself as an engineer.

In addition to the market segmentation service, Dell plans to incorporate credit scoring and finance services into the marketplace. It will also offer systems integration services, such as helping suppliers create electronic catalogs. Eventually it will link regular trading partners' internal enterprise systems through the Dell marketplace.

"We believe the next phase will be interconnected business networks connecting internal processes within a business to each other — such as connecting the finance organization of one company to another's to do accounts payable and accounts receivable processing," says John Hampton, Dell's director of new ventures. "Our intention is to collaborate."

Until recently, collaborative commerce has been little more than a buzzword on the business-to-business conference circuit. But now a handful of Internet market makers are beginning to deliver on the promise of linking multiple businesses and processes through a central marketplace to do more than buy and sell.

Among these is San Francisco-based Bid.com Inc., which operates an electronic marketplace for companies in the building, engineering and real estate industries. The various companies use the marketplace's collaborative tools and services to electronically manage large, commercial construction projects and to buy and sell materials and services.

San Francisco's Orchard Hotel is one of the exchange's more visible success stories. The building project, which came in two months ahead of schedule and earned the hotel an additional $1 million in revenue by opening early, was managed entirely on Bid.com, with contractors, project managers, suppliers, engineers and architects exchanging plans and work orders, buying materials and scheduling deliveries on the electronic exchange.

"The building industry is a highly fragmented one, with lots of islands of technology," says Bid.com Chairman Daryl Magana. What Bid.com does is integrate those systems into a single Web-based platform, which Magana says can cut between 5% and 10% from project costs that run in the hundreds of millions of dollars.

MARKETPLACE MIDDLEMEN

But even as marketplaces add collaborative features and other services, it remains to be seen which will survive the shakeout that analysts predict will occur within the next two years.

According to Forrester Research Inc. in Cambridge, Mass., companies that use exchanges now trade about $19 million in goods and services on one to two online exchanges. But by the end of next year, the average company will trade about $49 million in goods over four exchanges.

One of the big issues for both buyers and sellers is how to choose from among the hundreds of electronic marketplaces springing up each month.

Users and analysts agree that nearly all companies will likely do business at multiple marketplaces, which means integrating their internal enterprise systems to several different exchanges using different technologies, data formats and protocols.

"We have 55,000 SKUs in our store, and those aren't being serviced by any one exchange," says Rolando deAguiar, president of e-commerce at Rocky Hill, Conn.-based Ames Department Stores Inc., which operates 460 retail stores in 19 states. "I think down the road the exchange business will go through a consolidation where you have two, three or four very robust exchanges that aggregate features and do most of the [technology] integration work. You'll see us gravitating toward those key players."

One such newcomer is Seattle-based Vitessa Corp., an Emerging Companies winner that provides content-oriented sites, such as online gaming or news Web sites, with all of the technology necessary to add e-commerce functions.

This would enable, say, an online gaming site with no e-commerce capabilities of its own to sell games without buying and stocking inventory plus building all of the necessary technology infrastructure, such as order management and fulfillment capabilities, to support product sales.

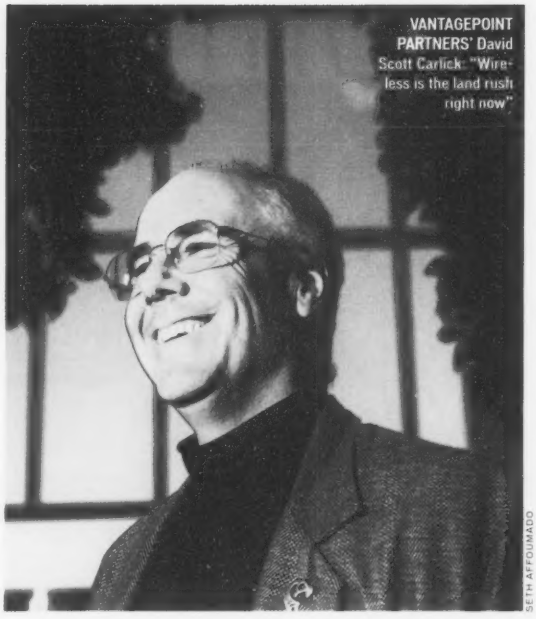
Gartner Group is forecasting the emergence of more so-called integration services marketplaces that will focus on links between trading partners.

"In order to survive, e-marketplaces must overcome increased operating costs and provide an extremely compelling reason for moving tightly integrated business processes to a marketplace," says Gartner analyst Carl Lenz.

So far, Lenz says, the complexity of enabling suppliers to participate in a marketplace has been overlooked, which has limited marketplace functionality and participation. But by 2005, more than 500,000 companies will participate in marketplaces as buyers or sellers or both, he says.

But which marketplaces those will be remains very much up in the air, as the ever-expanding number of industry consortia exchanges, new dot-com players and integration marketplaces continue to jostle for position.

"We are 10 minutes into a 24-hour poker game," says noted industry observer Jim Champy, a regularly featured *Computerworld* columnist. "It's far too early in the game to determine the winners and losers."



VANTAGEPOINT PARTNERS' David Scott Carlick: "Wireless is the land rush right now."

SETH AFFOUMADO

Picking A Winner

» As the first investors in an emerging company, venture capitalists scrutinize every aspect of a firm before spending a dime. Here's what VC firms look for when placing their bets. By PIMM FOX

How can IT management, charged with choosing and deploying new technologies, make meaningful decisions about working with a start-up? One way is to look at what early investors — venture capitalists — are looking for.

Computerworld spoke with nearly a dozen venture capital firms for this story. Each had slightly different priorities, but all focused on three things: products, people and potential.

IT'S IN THE PRODUCT

"If I was a CIO making an early bet, I would, of course, look at the product," says Promod Haque, a general partner at Norwest Venture Partners. Norwest, with offices in Boston and Palo Alto, Calif., is a backer of Yipes Communications Inc., an optical network service provider in San Francisco and a *Computerworld* Emerging Companies winner.

"I would need to see people who are sold on the product before I would even consider it," Haque says. And because any company whose product gets adopted becomes an integral part of the business, "I am looking for companies that have sticking power, and that means top management."

John E. Zeisler, head of Los Altos Hills, Calif.-based venture company Group Z, says, "You've got to make sure that the companies you do business with have solid investors as well as some strategic partners. That adds credibility. VCs are not doing this out of love, you know. Neither should a CIO."

In the case of Yipes, which offers a service to boost the amount of data that can travel on a network, Norwest asked complementary vendors that it invests in for assistance. "Because we invest in companies that both make equipment and deploy that equipment . . . we are able to see what both sides need," Haque says. That strategy — asking partners that work with a start-up to help assess the firm — could benefit information technology managers as well.

Duncan McCallum, a general partner at Cambridge, Mass.-based OneLiberty Ventures, which invests in storage server software vendor and Emerging Companies winner DataCore Software Corp. in Fort Lauderdale, Fla., says he looks for management that has vision and is solving a big problem for customers. "When you're looking at big opportunities, you want two things: customer pain and discontinuity," he says. "Because of the proliferation of e-mail, the Internet and data warehousing, the people who are managing storage are overwhelmed. There's great demand to manage these networks. There's big pain."

Some companies in market sectors that were hot a year ago may have trouble finding investors today. "Wireless is the land rush right now," says David Scott Carlick, a managing director at San Bruno, Calif.-based VantagePoint Partners. "More and more people are going to use cell phones to access services, and the carriers [are] looking for useful applications and compelling wireless uses."

"The venture business goes in cycles," says Todd Brooks, a general partner at Menlo Park, Calif.-based Mayfield Fund. "About four or five years ago, a lot of money went into unclogging the carrier bottlenecks. Today, we're seeing the trend of outsourcing critical components of a business for a bunch of reasons: Corporations can't deploy IT professionals fast enough, the cost of transporting data is so cheap that there's no reason for companies to host their [enterprise resource planning] applications and it is too complex for a firm to run its own applications."

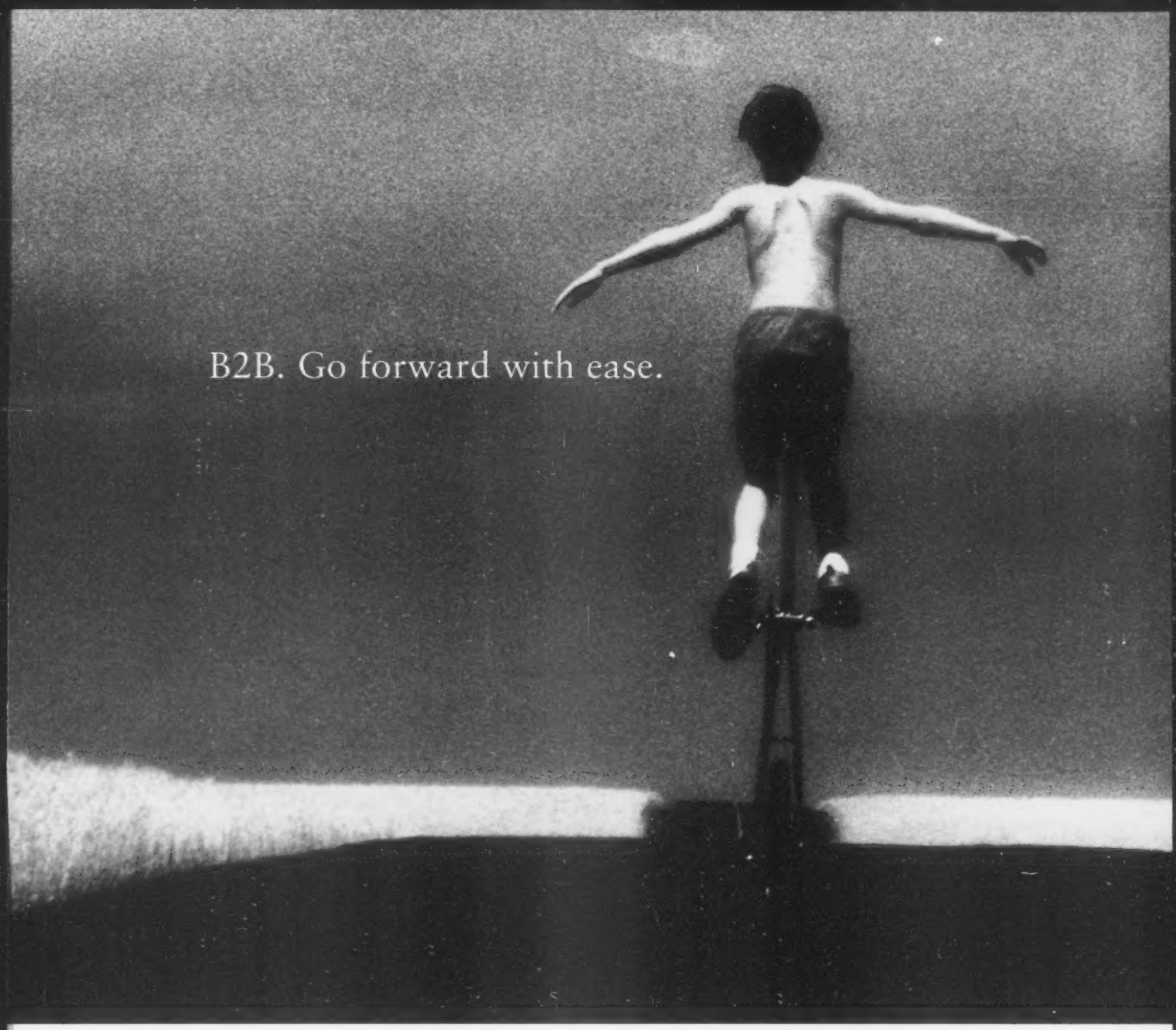
Indeed, Emerging Companies winner Interliant Inc., a Purchase, N.Y.-based provider of managed application hosting, messaging, enhanced Internet and consulting services, is trying to capitalize on that trend to move even critical business components to outside vendors.

BETTING ON OUTSOURCING

Venture capitalists are making big bets on outsourcing — some that won't pay off for venture capital firms or IT management. "Sure, in the case of managed storage, for example, you have to ask yourself, 'Is this something that already competes with entrenched players such as EMC?' because most venture people want to look at potentially billion-dollar companies," says Brooks. "After all, the cost of getting to profitability can be $100 million."

Another area for outsourcing is training. "Because of the usage and complexity of PCs and other network-connected devices, educating the user is a critical function," says Brian Frank, a principal at the W. R. Hambrecht venture group in San Francisco, which invested $6 million in Emerging Companies winner Service911.com Inc. in Dallas. Service911.com, which offers online technical support, is also backed by question-and-answer giant Ask Jeeves Inc. in Emeryville, Calif.

The venture capital community is still licking its wounds while trying to distance itself from the debacle of business-to-consumer Internet investments. But these firms still know how to pick winners. The watchwords are great management (which includes experience), great technology that isn't just an add-on to an existing product line and the potential to grab a significant share of an explosive market. The lesson for IT management may be that, in the end, there's one sure way to find the winners: Follow the money. ◗



Breakthrough technology enables B2B sooner, for dramatically lower costs. Now you can design a B2B solution in as little as three days, have your prototype operational in three weeks, conduct more than a million transactions per day, and enjoy savings month after month. Those are actual results reported by Attunity customers. Our revolutionary B2B integration software lets you create, share, automate and manage your business processes with customers and suppliers of any size, anywhere—while fully integrating your existing IT systems—and linking you with leading eMarketplaces. Register on our web site to learn how we're easing the way to B2B with companies like Compaq, Future Electronics, Verizon and Nu Horizons. Or call us today at (877) 888-8763.

ATTUNITY
This way to B2B

www.attunity.com/go/u1/

© Attunity Ltd., NASDAQ:ATTU

ASPs In the Catbird Seat

Being a company with a product can sometimes get in the way of doing business in the digital economy. At least that's what many start-ups are learning.

Bill Tomeo, CEO of TellSoft Technologies Inc., recalls how his Colorado Springs-based online voice service started as a traditional product that was licensed to a server. But the company shifted gears after its venture capitalist, Softbank Venture Capital in Mountain View, Calif., argued convincingly that becoming an application service provider (ASP) would be a better business model.

TellSoft is one of many emerging companies that have taken the ASP route. That's because by late 1998, venture capitalists like Trinity Ventures LLP in Menlo Park, Calif., began avoiding companies that insisted on developing and marketing packaged software.

Like Softbank, Trinity has encouraged at least one of its clients, Aventail Corp. in Seattle, to shift from licensing its products to offering them as an ASP.

This new venture-capital investment philosophy is a key component of an overall shift in business models that's been inspired by the Internet. Venture capitalists say they're motivated by the global trends they see in business today. Those trends point to more and more outsourcing of information technology functions.

According to Grady Means, co-author of *MetaCapitalism: The E-Business Revolution and the Design of 21st-Century Companies and Markets* (John Wiley, 2000) and a managing partner at PricewaterhouseCoopers in New York, the venture capitalist investment criteria and the emergence of ASPs are symptoms of an overall transformation of capitalism itself.

Means contends that ASPs represent a core trend for what he calls "metacapitalism," a new $200 trillion capital market made possible by the reinvestment strategies driven by the business-to-business economy. "Companies don't want to invest capital for what are essentially services," he says.

FOLLOW THE MONEY

This radical shift in the way large companies invest their capital makes the proliferation of ASPs inevitable, because corporate IT increasingly will focus on core business projects and outsource everything else. This will fuel staggering growth for ASPs, says Means, who suggests that most ASP market-growth estimates today, such as Stamford, Conn.-based Gartner Group Inc.'s prediction that the market segment will jump from $3.5 billion this year to more than $25 billion in 2004, are too conservative.

"People think we're well into these things. But it's just beginning," Means says.

Gus Tai is seeding many of the upstarts that are part of this transformation. A general partner at Trinity Ventures who's leading the firm's software investments, Tai says he believes the software development and distribution market is quickly shifting from a focus on creating products to a focus on delivering disposable services.

This shift in thinking among venture capitalists is no minor phenomenon, argues another Trinity general partner, Tod Francis. In Silicon Valley alone, nine new companies get funded every day, representing about $90 million in daily equity investments, he says.

Contrary to popular belief, says Francis, most companies funded by venture capital are successful and greatly influence

»» Outsourcing has made hosted software a hot market for start-ups and put these new ASPs in the limelight with venture capitalists. By MARK HALL

technology as well as business practices. For example, of all the venture-capital-funded companies in 1998, 20% went public, 40% were acquired, 30% are operating as private businesses and a mere 10% went under.

Trinity currently has more than $1 billion invested and an $800 million fund that was recently created for more early-round investments, making it more likely that ASPs will dominate the emerging-companies landscape in the years ahead.

"It's rare for us to fund a licensed model in new software companies," Tai says.

The latest and most appealing ASP business model no longer relies on up-front license fees and upgrade revenue. Instead, software charges are centered on time-based subscriptions or transaction volumes. No one will own software in the future, according to many venture capitalists — users will rent it.

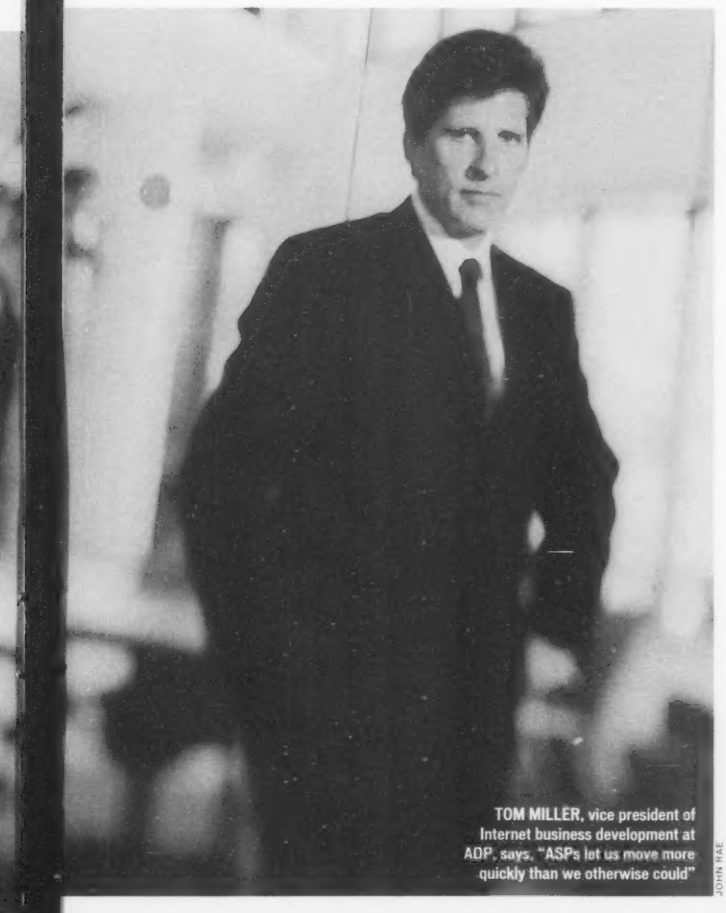
Automatic Data Processing Inc. (ADP) in Roseland, N.J., has been using CoVia Technologies Inc. in Mountain View, Calif., an Emerging Companies winner, to help it quickly deploy corporate portals for its 450,000 customers.

Like most companies, ADP didn't have the staff resources to create a portal infrastructure and then debug, extend and manage it. An ASP like CoVia, which offers a pay-as-you-go service, made it possible for ADP to quickly launch a new revenue-generating program.

Tom Miller, vice president of Internet business development at ADP, says today's business and technology climate forces conservative organizations like ADP to work with start-ups that have embraced the new business models. "ASPs let us move more quickly than we otherwise could," he says.

Beyond faster deployment, ASPs provide companies with access to complex software at a low cost, including advanced online exchanges. John Bowlsby, chairman and co-founder of Eden Prairie, Minn.-based SourcingDirect.com, an online business-to-business specialty marketplace for pet and feed suppliers, says Agiliti Inc., his Bloomington, Minn.-based ASP and an Emerging Companies winner, "keeps us on the cutting edge of technologies."

Bowlsby adds, "We know a lot about trading commodities, but technology is foreign to us."



TOM MILLER, vice president of Internet business development at ADP, says, "ASPs let us move more quickly than we otherwise could"

JOHN RAE

MAINSTREAM CHANGES

ASPs help IT departments offset staffing shortages and give them access to advanced services. They're also capable of automating old processes, just like traditional software is.

For example, at Dura Pharmaceuticals Inc. in San Diego, informing employees about their health care coverage, 401(k) plans and other company benefits had been a manual process. The company had to distribute benefits forms to more than 1,000 employees and then retrieve and submit the completed forms to the appropriate agencies. According to Teri Erickson, manager of employee benefits at the $320 million specialty drug maker, the old process required a full-time staffer just to handle the paper load.

After studying several options earlier this year, Dura picked Emerging Companies winner iBenefits Inc. in Los Angeles to automate the process through its online service. Erickson says introducing the ASP's software to employees was simple and adoption was fast — so fast, in fact, that Dura was able to immediately eliminate a position in the human resources department, which handled the paperwork.

IBenefits sets up all the back-end connections with Dura's insurance carriers and 401(k) fund managers. So when employees change insurance options during enrollment cycles or shift funds in their 401(k) portfolios, everything is handled electronically, and Dura's human resources department doesn't need to get involved.

Despite the positive performance of so many emerging companies, the media is awash with news of a business landscape littered with the virtual carcasses of dot-coms. This gives many managers pause when turning their operations over to relative newcomers.

Before New York-based Prudential Securities Inc. adopted TellSoft Technologies' iTalk streaming technology to deliver daily audio market updates as a service to its customers, Prudential did a thorough audit of the company, according to Stephanie Gannon, an assistant vice president at Prudential-Securities.com.

"We completed our traditional vendor analysis on TellSoft, as we were aware that they were a start-up. We implemented this system in a conservative manner," Gannon says.

Kurt Lovil, vice president of technology at 24x7Development.com Inc., a Web site development and integration company in Phoenix, said his due diligence for TellSoft, one of *Computerworld*'s Emerging Companies, included a review of its hosting operations, software architecture, business plan and accounting ledgers.

Lovil says that although he wasn't too worried about the ASP relationship, he was concerned about his supplier's technical support. But he rates TellSoft's support as "wonderful."

All this makes it likely that, for at least the foreseeable future, ASPs will continue to dominate *Computerworld*'s Emerging Companies list as they rapidly sell the services IT organizations need. ◗

Meet Your Future Backup – *ADIC's New Scalar 100*

A new standard in scalable tape libraries from ADIC, the Scalar® 100 has all the features you want in a backup solution now and in the future.

Unmatched Scalability. ADIC's Scalar 100 starts out as a one- or two-drive, 30-cartridge DLTtape library, comparably priced to smaller Compaq and HP units. Then it scales easily and cost effectively up to 6 drives and 60 cartridges to meet new storage demands and protect your investment.

Easy, Plug-in Connectivity. Simple plug-in modules let the Scalar 100 adapt to your changing storage needs–SCSI, SAN, or NAS.

More Storage in Less Space. With 50% more storage capacity than comparably sized products, the Scalar 100 packs 4.8TB* of storage capacity into only 14 rack units, saving valuable space for future growth.

Drive-Independent Design. Backup with DLT today, and with AIT, LTO Ultrium, and SDLT models tomorrow.

Unfailing Protection. Enjoy the highest level of service and support, including a full year of free on-site service from ADIC, the leader in open systems data storage solutions.

For more information, visit www.adic.com. Or call 1-800-336-1233.

adic

www.adic.com

*Capacity and transfer rates assume average 2:1 compression, unless otherwise stated.

All specifications subject to change without notice. Scalar and ADIC are registered trademarks of Advanced Digital Information Corporation. DLT and DLTtape are trademarks of Quantum Corporation. All other product and company names should be considered trademarks of their respective owners. © Copyright 2000 Advanced Digital Information Corporation

Mind Your Markets

>> What Emerging Companies need to do battle. By PIMM FOX

Judging from conversations with business analysts and consultants, after the first blush of excitement, the start-up field is often littered with problems, missteps and hard luck. That's not to say some of these companies won't find wide acceptance, but for most would-be entrepreneurs, the chances are slim.

So what do our Emerging Companies need to do to keep the attention of information technology managers and thrive in their markets? Here's what several industry insiders said about three key sectors.

OUTSOURCED STORAGE

Nishan Systems in San Jose, an Emerging Companies winner, says the best way to securely transmit data between storage devices and networked servers is over existing networks that use standardized IP.

It's a safe approach to be sure, but Mark McDonald, who heads The Center for Process Excellence at Andersen Consulting in Chicago, cautions that Nishan must consider that while acceptance of a new transport protocol, Fibre Channel, may be far down the road, some sectors of the market will wait for it. "You want something with technology legs, something that isn't going to lock you in before you are sure what will work," he says.

Yet Nishan claims its storage-over-IP products can deliver service as fast or faster than Fibre Channel technology and eliminate the need for new networks. And with storage over IP, stored data can be accessed from anywhere; Fibre Channel technology is limited to 60 miles. Fibre Channel advocates counter that it has price/performance leadership for storage and networks and supports multiple protocols such as SCSI, TCP/IP, video or raw data.

So a challenge for Nishan is to figure out to what extent the competing standard will win favor, and then how to build in support for new technologies once they become viable and offer the same service levels.

And then there is the specter of EMC Corp. in Hopkinton, Mass. — the industry's dominant storage provider. According to Julian Chu, an analyst at Cambridge, Mass.-based Internet strategy consulting firm Mainspring, "EMC has high margins and most of its product development is in software — the replication of data over a wide-area network." Yet there is potentially financial support for Nishan coming from EMC and several reseller partners set to introduce storage-over-IP products. And in September the company bolstered its war chest with a $50 million funding round and strategic investments from industry heavyweights like Sun Microsystems Inc. and Dell Computer Corp.

INTERNET-BASED APPS

2netFX, an Emerging Companies winner, sees broadband over IP-based networks as the way to deliver content to customers faster using multimedia streaming. By focusing on high-quality digital video to desktop PCs, TVs and kiosks, San Jose-based 2netFX sees opportunity in broadband Internet broadcasting, conferencing and corporate and educational training.

But Baskey wonders whether the company "can play the scale game in the business. Scale doesn't matter as much in the [customer relationship management] space as it does in broadband," he says. "People have been talking broadband since 1994, and it was the right business model at the wrong time. To take advantage of the broadband network you have to deliver your service to lots of customers, otherwise it may not be profitable."

Echoing the economy-of-scale dilemma for video stream, Chu says it quickly becomes a commodity service for the lowest price: "The play that wins is a combination of operational excellence for the lowest price along with meeting industry standards." That's what 2netFX says it's in the process of doing.

E-MARKET EXCHANGES

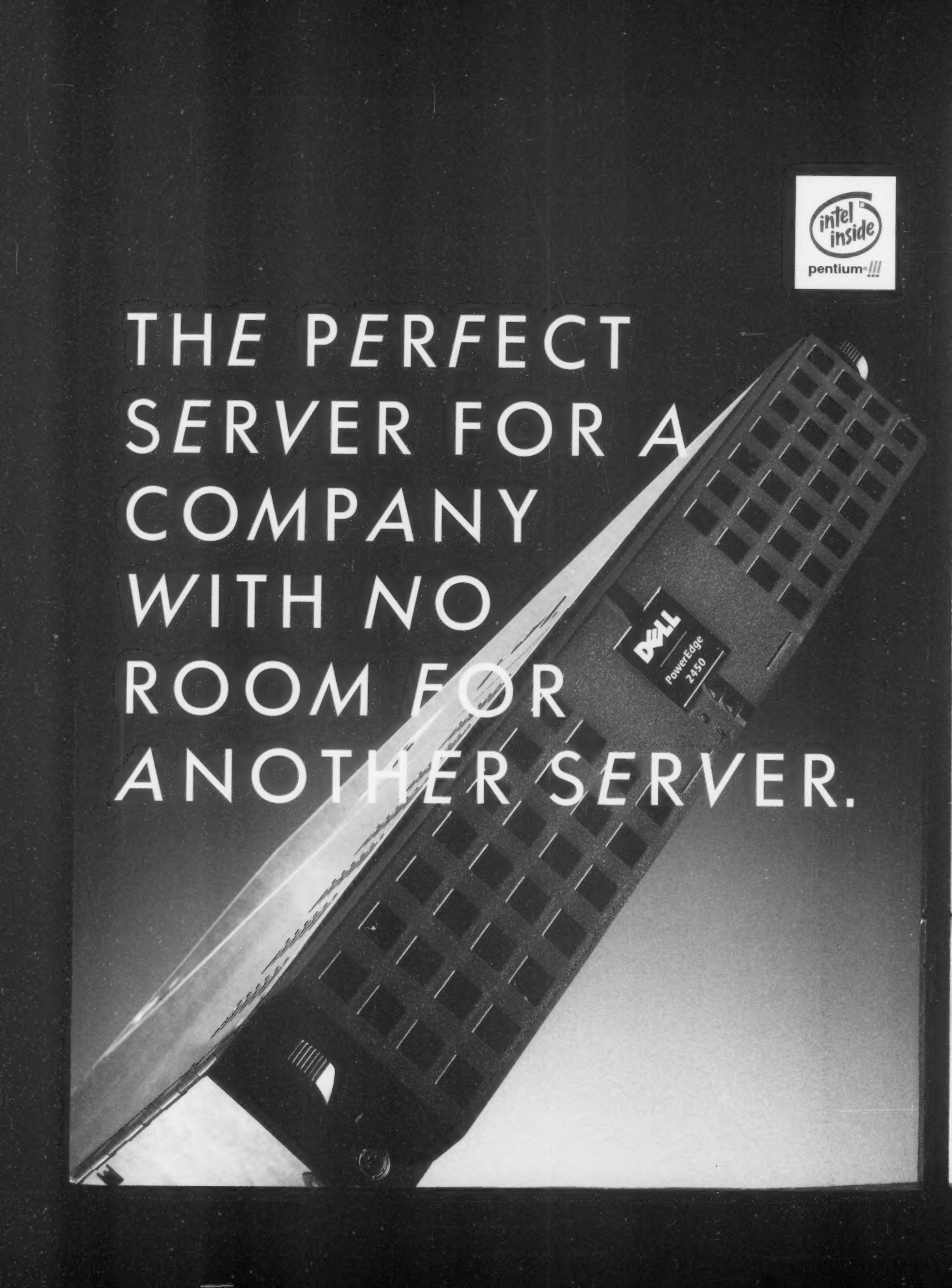
In the e-market space, "the exchange is only valuable as more people use it," says Chu, "that's why market penetration is a success factor and a prime driver in the business." With its software, Emeryville, Calif.-based CommerceRoute Inc., an Emerging Companies winner, allows participants to collaboratively share and automate processes over the Internet without placing a burden on IT departments. So while the IT staff may need to facilitate the initial installation and operation, it isn't a daily task.

Travel2Events.com uses CommerceRoute software to integrate fulfillment partners and manage workflow by connecting travel and entertainment providers with publishers and sites to achieve an open support system. CommerceRoute automates data exchange with the fulfillment providers' systems.

"Order fulfillment has proven the Achilles' heel for many e-commerce companies, not in terms of outbound logistics, but more broadly in many areas of supply-chain management," says McDonald. CommerceRoute wants to stay in the spotlight as it helps firms avoid this pitfall.

Regardless of their market, start-ups face an uphill climb. Only a small number achieve success, whether they are bought by larger companies, merged into others or morph into something new.

The winners are those with the lucky — and calculated — combination of talent, timing and resources.


intel inside
pentium III
THE PERFECT SERVER FOR A COMPANY WITH NO ROOM FOR ANOTHER SERVER.
DELL
PowerEdge 2450

Finally, a server that not only fits your company's needs, but also fits in your company. The Dell™ PowerEdge™ 2450, with its ultrathin 2U form factor, allows up to 21 servers and 42 processors in a 42U Dell rack. But don't let its size fool you. Like Dell's complete line of servers, it packs a lot of power. With dual Intel® Pentium® III processor capability at up to 1GHz and 133MHz Front Side Bus, the PowerEdge 2450 will give your company all the computing power (and elbowroom) it needs.

DELL™ SERVERS:

DELL™ POWEREDGE™ 1400

NEW—Small Business Value Solution

- Intel® Pentium® III Processor at 800MHz (up to 1GHz)
- Dual Processor/RAID Capable
- 128MB 133MHz ECC SDRAM (up to 2GB)
- 9GB® 7200 RPM Ultra3 (Ultra 160) SCSI HD (up to 36GB® 10K RPM)
- Up to 144GB Internal Storage Capacity
- Integrated NIC/SCSI Controllers; 48X Max CD-ROM
- Dell™ OpenManage™ Server Management Solutions
- 3-Yr NBD On-site Service†; 7x24 Phone Support

$1599 E-VALUE CODE 31372-291115

BUSINESS LEASE: $44/MO., 48 MOS.††

- 2nd 9GB® 7200 RPM Ultra3 SCSI HD, add $219
- Small Business Upgrade Bundle, add $1879

DELL™ POWEREDGE™ 2450

Ultra-Slim (2U) Rack-Optimized Server

- Intel® Pentium® III Processor at 733MHz (up to 1GHz)
- Dual Processor/RAID Capable
- 128MB 133MHz ECC SDRAM (up to 2GB)
- 9GB® 10K RPM Ultra3 SCSI HD (up to 36GB®)
- Up to 180GB Hot-swappable Internal Storage Capacity
- Integrated NIC/SCSI Controllers; 24X Max CD-ROM
- Dell™ OpenManage™ Server Management Solutions
- 3-Yr NBD On-site Service†; 7x24 Phone Support

$2489 E-VALUE CODE 31372-291124

BUSINESS LEASE: $69/MO., 48 MOS.††

- 2nd 9GB® 10K RPM Ultra3 SCSI HD, add $349
- MS® Windows® 2000 Server, add $799

DELL™ POWEREDGE™ 2450

Ultra-Slim (2U) Rack-Optimized Server

- Intel® Pentium® III Processor at 733MHz (up to 1GHz)
- Dual Processor/RAID Capable
- 128MB 133MHz ECC SDRAM (up to 2GB)
- 9GB® 10K RPM Ultra3 SCSI HD (up to 36GB®)
- Up to 180GB Hot-swappable Internal Storage Capacity
- Embedded Single-channel RAID with 64MB Cache
- Redundant Hot-swappable Power Supplies
- Integrated NIC/SCSI Controllers; 24X Max CD-ROM
- 3-Yr NBD On-site Service†; 7x24 Phone Support

$2999 E-VALUE CODE 31372-291129

BUSINESS LEASE: $83/MO., 48 MOS.††

- NEW Red Hat® Linux™ 7.0, NOW $0

DELL™ POWEREDGE™ 4400

Dependable Departmental Server

- Intel® Pentium® III Xeon™ Processor at 866MHz (up to 1GHz)
- Dual Processor/RAID Capable
- 128MB 133MHz ECC SDRAM (up to 4GB)
- 9GB® 7200 RPM Ultra3 SCSI HD (up to 73GB® 10K RPM)
- Up to 510GB Hot-swappable Internal Storage Capacity
- Integrated NIC/SCSI Controllers; 40X Max CD-ROM
- Dell™ OpenManage™ Server Management Solutions
- 1-Yr DirectLine® Network Operating System Support
- 3-Yr NBD On-site Service†; 7x24 Phone Support

$4189 E-VALUE CODE 31372-291141

BUSINESS LEASE: $116/MO., 48 MOS.††

- 2nd 9GB® 7200 RPM Ultra3 SCSI HD, add $279

DELL COM

USE THE E-VALUE CODE TO GET EXACTLY WHAT YOU WANT | **800.374.6818** | WWW.DELL.COM

VALUE

USE THE POWER OF THE E-VALUE CODE. Match our latest technology with our latest prices. Enter the E-VALUE code online or give it to your sales rep over the phone. www.dell.com/evalue

Call: M-F 7a-9p | Sat 10a-6p | Sun 12p-5p CT | Canada: 800-879-0148 | Mexico: 001-877-200-3229 | USA Customers: PCS-ZSF-40240

Prices, specifications, and availability may change without notice. Taxes and shipping charges extra, and vary. Cannot be combined with other offers or discounts. U.S. only. Software may be preinstalled as third party Technician will be dispatched, if necessary, following phone-based troubleshooting. Availability varies. For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. †Business leasing arranged by Dell Financial Services L.P. an independent entity, to qualified customers. Lease payments based on a 48 month FMV purchase option lease and do not include taxes, fees and shipping charges. Subject to credit approval and availability. Lease terms and pricing subject to change without notice. Dell, the Dell logo.com icon, the Dell X Com logo, and dudell.com, E-Value, DellWise, PowerEdge and PowerApp.web are trademarks of Dell Computer Corporation. Intel, the Intel Inside logo, and Pentium are registered trademarks and Intel SpeedStep, Pentium III Xeon, and Celeron are trademarks of Intel Corporation. MS, Microsoft, BackOffice, Windows NT and Windows are registered trademarks of Microsoft Corporation. ©2000 Dell Computer Corporation. All rights reserved.

In the wireless world,

the killer app is the one you already have. To use your killer app, you need NetMotion.™

With WRQ NetMotion wireless connectivity software, the only thing you have to give up is the wire.

Now with wireless VPN

RUNS OFF-THE-SHELF APPS

WWAN AND WLAN

EXTEND BATTERY LIFE

COMPRESSION

NETMOTION V. 2.0

ENCRYPTION

WORKS ON ALL MAJOR WIRELESS HARDWARE

TRANSPARENT ROAMING

SECURITY

APPLICATION PERSISTENCE

Wireless or wired, see us at
www.wrqnetmotion.com/killerapp
For more information, call: 206.217.7100 or 800.872.2829

WRQ®

© 2000 WRQ, Inc. All rights reserved. WRQ, the WRQ logo, and NetMotion are either registered trademarks or trademarks of WRQ, Inc., in the USA and/or other countries. All other trademarks, trade names, or company names referenced herein are used for identification only and are the property of their respective owners.

Speeding The Web

›› Caching tools from emerging companies can crank up your Web business.

By RUSSELL KAY

Www doesn't really stand for "world wide wait," but the stereotype, like some, is based in fact. "The biggest complaint about using the Web is its slow speed," says David Strom, an Internet industry analyst in Port Washington, N.Y.

And as more people get high-speed Internet access, they're likely to blame delays on a site's owner. The problem is serious for business-to-business marketplaces and worse in the business-to-consumer arena, where people won't wait for a slow page. So speeding up your Web site is an imperative. How do you do that? Here are a few useful tips, with advice from some users who have found products from our Top 100 Emerging Companies to help them.

Highly graphical Web pages can be effective, but large files make for long downloads. Modern compression techniques can often make a graphic smaller by an order of magnitude, with little or no visible quality degradation. Also, subdividing complex graphics into several smaller files can cut downloading times.

Consider navigation: How do visitors find what they're looking for on a site? Clearly marked and labeled links ease the task, while confusing pointers or buttons add frustration and misdirection.

Good design is necessary but not sufficient. For a high volume of transactions, you need massive computing power: lots of servers and good Web connections. But if a site provides a lot of images or other large-file content, it makes sense to distribute those servers around the country or the world. An enterprise can do this without maintaining multiple physical server sites by using a distributed service, such as one offered by Akamai Technologies Inc. in Cambridge, Mass. Companies can also use dedicated caching server hardware and software like that from CacheFlow Inc., one of *Computerworld*'s Emerging Companies, and Network Appliance Inc., both in Sunnyvale, Calif. If you do opt for external caching, make sure your content is synchronized at all the cache sites. Here's how some e-commerce sites have used caching to speed up their sites:

San Diego-based ProFlowers.com opted to install specialized caching servers to improve its Web site's performance. Yoshio Kurtz, ProFlowers' director of research and development, notes, "We figured that for every CacheFlow appliance we installed, we would have had to implement four or five additional Web servers to see similar performance gains. And because [these servers] require little maintenance and run their own operating system, we have avoided the significant labor costs [of] implementing so many new Web servers."

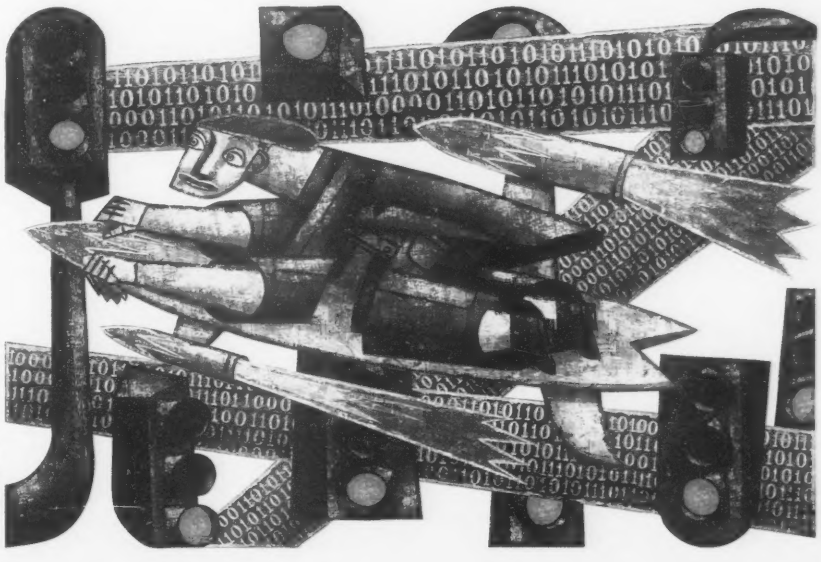
To prepare for last year's holiday season, KBkids.com in Denver upgraded its infrastructure by deploying CacheFlow appliances in front of its e-commerce site and outside the firewall. This cut the time needed to deliver full pages to customers and lightened the load on its servers and firewall. CacheFlow servers store and serve the content users most frequently request and monitor the source pages behind the firewall for content changes.

Srikant Srinivasan, founder and CEO of KBkids.com, says, "Since we upgraded our technology infrastructure, response time for content has been reduced substantially."

Delayed response is magnified if your site delivers streaming audio or video. Strategies to deal with streaming media problems include multiple caching (either within your site or via an external network), "overflow" servers and satellite transmission.

If streaming normal video presents a problem, how about high-definition television (HDTV) broadcast over an IP network? San Jose-based 2netFX.com Inc., also a *Computerworld* Emerging Companies winner, has products to tackle those problems at both the client and server ends. David Hurwit, director of the Convergence Lab at 3Com Corp., one of 2netFX's partners in developing this technology, says HDTV over IP will enhance dot-com applications and services.

That's music to some people's ears. Thomas MacCalla, chief operating officer at the Entertainment Technology Center, a consortium of movie studios and technology companies, says, "Many of us in the entertainment community and academia have been eagerly anticipating this day." ◗



RICHARD DOWNS

Overcoming Software Volatilities

» Installing the latest software on your network? Take it from the pros: No new program is entirely risk-free. By DEBORAH RADCLIFF

Last year, security consultancy @stake Inc. in Cambridge, Mass., was hired to validate the findings of a well-known security assessment tool at a government agency. Turns out, the scanning software itself was so insecure that it risked the integrity of the entire network, according to @stake's vice president of research and development, who goes by the hacker handle "Mudge."

Nothing unusual there — similarly harrowing tales of software-induced vulnerabilities abound in the information technology industry.

Not only are common operating system browsers, mail servers and other popular software tools full of bugs and vulnerabilities, but the very software designed to protect the network can also be tricked, hacked or forced to render gaping security holes into the networks they're supposed to protect. For example, some well-known firewalls, including Cisco Systems Inc.'s Pix and Check Point Software Technologies Ltd.'s FireWall-1, have been fooled by denial-of-service and IP fragmentation attacks (packets sent with improper sequences or sizes).

"All software from all vendors starts out insecure," says John Pescatore, research director of security products at Gartner Group Inc. in Stamford, Conn. "A brand-new code base from a big vendor is likely to be as insecure as a brand-new code base from a start-up vendor." That begs the question: If seasoned vendors create code with such vulnerabilities, what about software developed by emerging software companies?

RUSHED SOFTWARE

While many in the IT community say they feel the new vendors have more at stake if their products create security problems, users of new vendor products say start-ups pose more of a security risk because they hastily develop code in a rush to market.

"As a rule of thumb, when you put new software on a system, you are introducing new vulnerabilities. Commercially developed software from start-ups is particularly notorious for these problems," says Scott Blake, security program manager at BindView Corp., a security tools vendor in Houston.

Citing BindView statistics, Blake says poorly written new software is responsible for a 90%-per-year rise in security vulnerabilities. The best way to avoid software security problems is to never run Version 1.0 on a production system, advises Pescatore. "Vendors have caught on to this and seem to be starting their version numbering with 3.0," he says.

Rafael Arroyo, network analyst at United National Bank in Bridgewater, N.J., says he agrees that start-ups should, in theory, produce clean code the first time out if they want to capture market share. But in reality, he says, start-ups commonly use him and other IT managers as unwitting beta testers.

"The new vendors have this business plan of 'Get the product out there quickly,' " he says. "When we call those vendors and tell them there's a security problem, they'll say they've got a patch and they'll send it quickly. But we all know that if the patch was ready, it would have already been in or with the product."

For this reason, Arroyo buys from new vendors only if they offer a money-back guarantee. "I purchase it, test it hard-core for 30 days, and if I don't like it, I send it right back," he says.

The ideal is finding a vendor whose product has undergone third-party independent security testing and can provide the testing documentation, which few, if any, do, according to Pescatore. Barring that, Pescatore recommends researching the background of the new vendor's chief technology officer or vice president of product development. Finding out if these key people came from a game company or a security company would be useful, he says.

EVALUATING PROBLEMS

Mark Decker, team leader at BF Goodrich Aerostructures, AAG Corp., which has U.S. headquarters in Raleigh, S.C., starts his product evaluations by reading white papers and media evaluations. He also asks for and checks user references.

"[When evaluating software from new vendors], I purchase it, test it hard-core for 30 days, and if I don't like it, I send it right back.

– RAFAEL ARROYO, NETWORK ANALYST, UNITED NATIONAL BANK

JOHN RAE

Even before selecting a new software tool, determine exactly what you need your new product to do. In May, Arroyo was looking for a product to monitor which programs employees access. He says he chose EventAdmin from Powell, Ohio-based Aelita Software Inc. (one of *Computerworld*'s Emerging Companies), mostly because he felt the company would, at the very least, be responsive.

When the product arrived, Arroyo took advantage of the 30-day evaluation to conduct testing in a mock network environment. "In this case, the software is internal to the network, and it doesn't run with admin privileges," he says. "So even if someone hacked it, EventAdmin can't do anything malicious because it only has access to a log file."

WEAK POINTS

Decker followed this strategic process when considering another Aelita program called ERDisk to automate the task of building daily backup repair disks for his network servers. When evaluating the test copy of the software, he determined the program's strategically weak point was that it needed Windows NT administrative privileges to run. If an application with administrative privileges or, in the case of Unix, root privileges gets cracked, it then gives the attacker complete control over the machine and all other programs running on it.

"Anytime you have a program that requires administrative-level privileges to run or interact, you need to be aware of what it's doing," Decker says.

In a controlled environment, Decker's testing team monitored ERDisk as it traveled throughout the test network to see what data it collected and from where until the team was satisfied the program stayed contained to just those processes it needed to function. He also hit it with a barrage of hacker tools to see if an attacker could exploit the application to gain administrative privileges.

Arroyo is just as concerned with applications that require him to open extra ports to travel to and from the network. "I had a problem in some automatic stocks-and-bonds updating software I was trying to test. It locked up even though the user account was set up with password, port number and proxy server," he explains. "The update program was problematic with five different types of firewalls, because the user account would only work if we punched a hole through our firewall. Eventually, I chose another product."

Once the application is on the network, Arroyo and Decker make sure the application is retested during a follow-up or scheduled network security assessment. This overlapping testing process is the ideal, according to Mudge, who adds that you can't test a new application too much, especially if that application faces the big, bad Internet.

"The Internet is a hostile environment. You don't know what sort of data will be thrown at an application," he says. "Don't be afraid to kick the tires and see how an application comes out under stress. You want to make sure that if it fails, it fails in a safe manner, which means it fails closed, without giving up services or information to an attacker." ◗

OF LIABILITY AND RESPONSIBILITY

Vendors and customers have different responsibilities in making software more secure, says Mary Ann Davidson, director of security product management at Oracle Corp.

Vendors, she says, should engineer their applications more securely in the first place. To do this, she says, vendors should do the following:

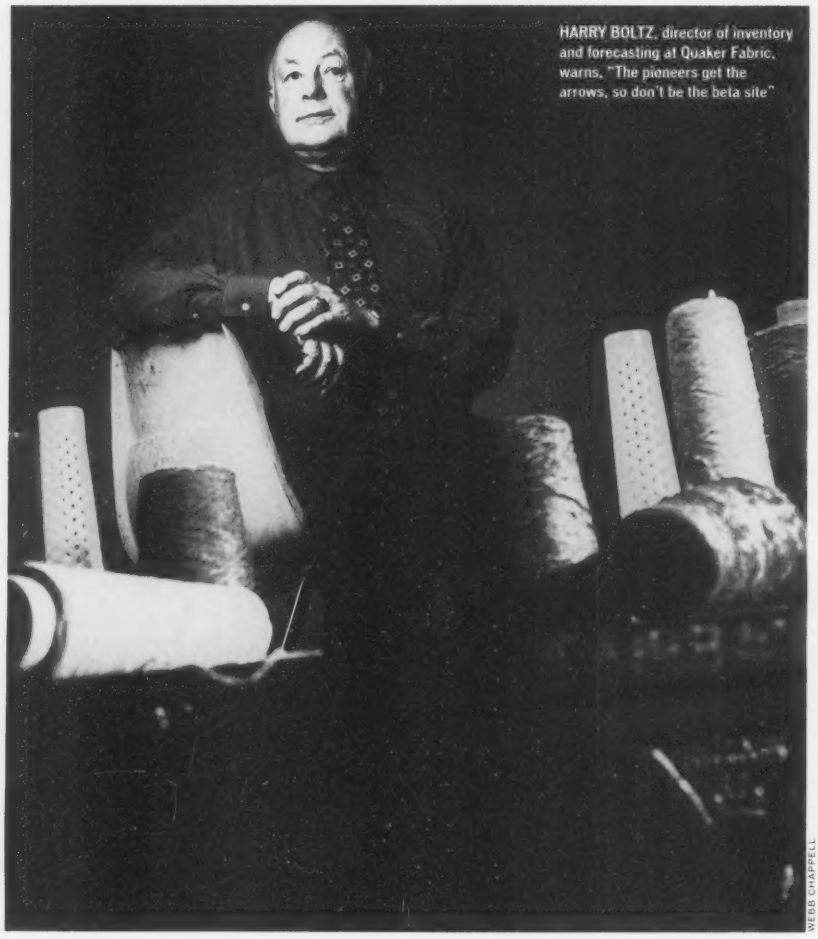
- **Develop a core group of security experts to put security into application design itself.**
- **Centralize common security functions to work together.**
- **Develop security coding practices to avoid common vulnerabilities like buffer overflow.**
- **Conduct regression testing to make sure new versions don't negate previous security controls.**
- **Submit to independent product assessments and security evaluations like the Common Criteria testing program, sponsored by the National Institute of Standards and the National Security Agency *(http://csrc.nist.gov/cc/).***

Customers, she says, should do the following:

- **Make security part of the purchasing criteria.**
- **Evaluate a product before installing it on the network.**
- **Report incidents and vulnerabilities to the vendor.**
- **Apply patches promptly.**
- **Conduct regular security audits on the network.**

» Sure, there's risk. But customers of software start-ups say the payoff can be dramatic.

By STEVE ALEXANDER



HARRY BOLTZ, director of inventory and forecasting at Quaker Fabric, warns, "The pioneers get the arrows, so don't be the beta site"

WEBB CHAPPELL

Big Risks. Even Bigger Rewards

Buying software from emerging companies can be risky. It means taking a chance on a small firm that has little or no track record, unproven technology and software that's probably still being debugged.

But there's a big upside, too. Exploiting a start-up's advanced technology can provide customers with a competitive edge.

So, what's it like to work with an emerging company? Customers of four start-ups say they had good experiences and that the risks can be managed — in fact, knowing what they know now, they'd do it again.

One way to mitigate risk is to be an early customer, but not the first one, says Harry Boltz, director of inventory and forecasting at Quaker Fabric Corp., a Fall River, Mass.-based supplier of upholstery fabric to the furniture industry. His company is using iCollaboration supply-chain software from Adexa Inc. in Los Angeles, one of *Computerworld*'s Emerging Companies. Boltz says the software corrects a major flaw in manufacturing resource planning systems: their inability to take into account manufacturing-capacity bottlenecks.

"The pioneers get the arrows, so don't be the beta site," Boltz says. "It's better to do your homework and talk to existing customers. Although we're only the third textile company to use this software, there is an advantage in that."

WHEN BIGGER ISN'T BETTER

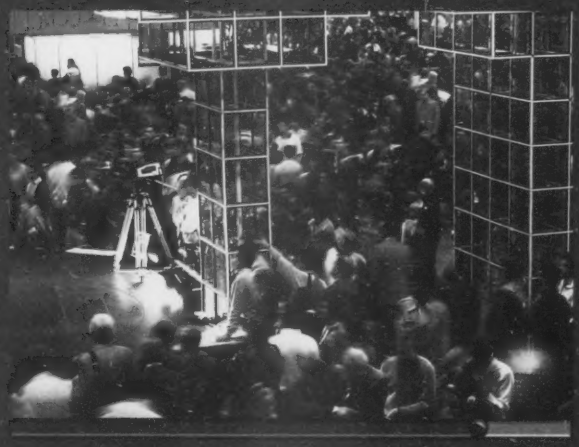
But don't hang back too long when picking a start-up. Another Adexa customer, Philips Semiconductor, says the lesson to be learned from doing business with small start-ups is that they can have better products than larger, established companies.

"A big company is not always better," says Ken Williams, business systems manager at Philips Semiconductor in Albuquerque, N.M. His firm initially rejected Adexa because it thought the company was too small — and, as a result, lacked the necessary corporate partnerships and financial stability — even though its product offered better functionality.

"Don't weed out the small companies," Williams advises, noting that Adexa has been willing to change its software to meet the needs of its customers. "Too often, the big software

If we ran this trade show, everyone could have attended without actually attending.

Us



You

Your audio. Your video. Directly to your audience.

What if you never had to elbow your way through a convention hall again? Or wear a "My name is" name tag? Or carry one of those plastic bags stuffed with pamphlets you'll never read? At Activate, that's our goal. Not to do away with trade shows, but to help you use streaming media to make your life easier. To help you bring your audio, your video, your message, your trade show booth, directly to anyone you want, anywhere in the world. For more information, call us at 1-877-577-9261 or look us up on the Web at **Activate.com.**

activate
a cmgi company

©2000. Activate Inc.

Big Risks. Even Bigger Rewards

companies won't do that. They just sell you the software and then move on to someone else."

Reduced time-to-market is another factor that mitigates the risk of doing business with an emerging company, says Rick Lowe, vice president of customer service and support at ClickRebates.com Inc., a Santa Clara, Calif.-based firm that pays consumers to view advertising on the Web. His firm uses RightNow Web, a software product from Emerging Companies winner RightNow Technologies Inc. in Bozeman, Mont., that integrates features such as self-help instructions, e-mail management and live Web chat into a single product suite.

Emerging companies and dot-coms are made for one another, Lowe says. "Start-ups move light and fast compared to traditional companies. And if you are in a dot-com company like ours, you have to move fast too," he says.

As a result, a dot-com is quick to take on a promising but untried technology from an emerging company, Lowe says. "The start-up's latest product may not be the most beautiful thing in the world, but it may be feature-rich," he says. "The documentation may be thin when they first introduce the product, but it doesn't matter if the product doesn't break."

Another way to reduce risk when dealing with a new firm is to schedule payments based on the achievement of performance milestones, says Bill Lilla, vice president of marketing and strategy at Peet's Coffee and Tea Inc., a retailer in Emeryville, Calif. Peet's uses E.4, a data management application from Emerging Companies winner E.piphany Inc. in San Mateo, Calif., to manage a customer database for online and mail-order sales and to analyze sales information.

"Designing your agreement in terms of compensation based on performance is a motivator for the emerging company and a good protective device for you. You also should get a firm commitment on staffing levels and be very clear about what roles the vendor's people and your people will play," Lilla says. "If the vendor has good intentions, as E.piphany did, they will agree to those things, because they have confidence in their product."

Sometimes, your own company's strengths can help counterbalance potential weaknesses in an emerging company, Lilla says.

"Our risk in going with someone like E.piphany was the question of whether they would be able to retain their employees, who were highly skilled in databases and customer relationship management," Lilla says. "But we felt they were on the right track and offered the skills we needed. And we felt confident that we could manage the software once we got beyond the initial installation."

But be prepared to spend a lot of time helping the company install its software, says Jim Latimer, director of purchasing at Genentech Inc., a genetic engineering firm in San Francisco. Genentech is using Chemdex MarketLink, an online marketplace built by Emerging Companies winner Ventro Corp. in Mountain View, Calif., that links life sciences companies to their suppliers. Although the project came in on schedule, the non-IT executives at Genentech were amazed at how long it took.

"Don't underestimate the amount of time it takes to develop something with a software development company. In what was a brand-new area like this, there were a lot of unknowns and technical difficulties," Latimer says.

But even though dealing with an emerging company took a lot of time, it was more practical for Genentech than developing the e-commerce application on its own would have been, he says.

"The risk of using a start-up company . . . was mitigated by the fact that we didn't want to spend the time and money right then to do it ourselves," Latimer says.

But taking a chance on emerging companies has paid off for these customers. They say the technology from the start-ups helped them get ahead of competitors, keep customers happy or save money.

"In the textile industry, our customers are demanding shorter and shorter lead times. One way for us to do that is to reduce the manufacturing cycle time," Boltz says. The Adexa software does that by being more reliable than Quaker Fabric's previous software and by optimizing production scheduling, based on data about raw materials availability and production bottlenecks.

> **"Too often, the big software companies . . . just sell you the software and then move on to someone else."**
>
> -KEN WILLIAMS

SETH AFFOUMADO

CLICKREBATES.COM'S RICK LOWE: "Start-ups move light and fast. . . . And if you are in a dot-com company like ours, you have to move fast too"

"The cost of the software was more than justified," Boltz says. What's more, he adds, "any company that doesn't have this product risks going out of business within five years if their competitors adopt it."

Williams says it's hard to measure the additional business Philips Semiconductor gets as a result of delivering semiconductors on time. But he says he's convinced that customers are pleased that the Adexa software helped Philips plan production runs more effectively.

"The only way to quantify that is to assume that if you do what you say you will do, a customer comes back. And that equates to more revenue," Williams says.

Lowe says his company can dramatically increase the number of consumers who view its advertisements because the RightNow Technologies software automates much of the site's work. That lets him support 350,000 Web customers with a staff of six people. The software's self-help knowledge base answers routine questions about the site's business at a rate of 18,000 to 29,000 queries per week. As a result, it's possible to provide turnaround in less than two hours on problems that require the help of a service representative, he says.

Lowe says the combination of the software's advantages and using help desk people based in the Philippines helps keep his costs low. "My support costs are 10% that of my competition," he says.

The rewards of dealing with emerging companies can be substantial, and the risks of dealing with them are sometimes exaggerated, Lilla says.

"With an emerging company, the risk is in losing the talent, the support and the continuity of the people who have been working on your installation," Lilla says. "But if you really think about it, those risks exist whether you are doing business with a small, mid-size or big company."

If anything, an emerging company may be more inclined to take care of its customers than a more established firm would be, Lilla says. The reason? To an emerging company, every customer is special.

Alexander is a freelance writer in Edina, Minn.

Drive to your great new job in a brand new ~~Yugo~~ BMW 323i

Sign up for a job alert with ITcareers.com...and you could!

ITcareers.com is the only career site that features the complete listing of jobs from ***Computerworld's 100 Best Places to Work in IT.*** Sign up for our FREE Job Alert service today, so that we can notify you via email when one of these job opportunities becomes available. You will automatically be entered into the sweepstakes for your chance to win. See rules below.*

Grand prize choices include:

- a BMW323i
- $25,000 in cash
- a Caribbean cruise

or hundreds of other great prizes!

Take advantage of the red-hot job market, and you could drive to your new job in a brand new BMW323i!

ITcareers.com is the exclusive career service of the ITworld.com Network – CIO, Computerworld, InfoWorld, ITworld.com, JavaWorld, LinuxWorld, Network World, and SunWorld – providing career-improving resources for IT professionals. ITcareers.com also features a broad array of recruitment features and services including job search, email job alerts, career advice, eNewsletters, and Careerwebcasting.

Visit www.ITcareers.com/top100 today and check out the best IT jobs at the best companies.

IT careers.com

a service of the ITworld.com network

100,000 SWEEPSTAKES OFFICIAL RULES. NO PURCHASE, SALES PRESENTATION, PAYMENT OR CONTRIBUTION NECESSARY. Presented by ITcareers.com. $100,000 Sweepstakes. For a chance to win any prize below, follow entry instructions elsewhere in this offer. Sweepstakes begins 9/5/99. Entry must be received by date specified elsewhere or by 1/15/01, whichever is sooner. Winners selected in random drawings conducted on or about 4/30/01 by Ventura Associates, Inc., whose decisions are final, at 1040 6th Ave, NY, NY 10018. Open to legal residents of the 50 United States, Washington, D.C., Canada and (in those areas where made available in Europe, Australia, New Zealand and South Africa) who received the offer. Void where prohibited by law. Consumer Disclosures. Different creative presentations may present different prize choices. Prize levels Grand through Third will offer a variety of merchandise items such as vacations, electronics, home items, etc. Winners may select any prize offered at level won. Values at a given level will be approximately the same. Approximate retail values (ARV) of merchandise prizes: 1 Grand - ARV $25,000, 1 First - ARV $2,000, 1 Second - ARV $1,000; 50 Third @ ARV $100 each; 1,000 Fourth Prizes - ARV $69 each. Total: $102,000. Cash alternative offered for Grand Prize only. All prizes will be awarded. Prizes that cannot be shipped to winner's home by common carriermust be picked up at local dealer. Costs related to use of prizes such as but not limited to taxes, title, license, and registration fees are winner's responsibility. Odds of winning determined by total number of eligible entries received.Estimated maximum distribution: 500 million. Therefore, odds of winning any of the 1,053 prizes will be no worse than 1:500MM. For winners list, available after 6/30/01, send self-addressed, stamped envelope by 5/31/01 to: "$100,000" Winners, PO Box 1162, Ellenton, FL 34222-1162. THE FOLLOWING ALSO APPLIES: No mechanically reproduced entries. PURCHASE, SALES PRESENTATION, PAYMENT, OR CONTRIBUTION WILL NOT IMPROVE CHANCES OF WINNING. No responsibility assumed for lost, late, misdirected, damaged, incomplete, illegible or postage-due mail/entries. All entries become property of their respective presenters and will not be returned. Any winner will be notified in writing within 2 weeks of selection unless otherwise specified. Winner may be required at discretion of judges to sign & return an Affidavit of Eligibility/Liability Release and where legally permissible a Publicity Release within 14 days of date on notification. Acceptance of a prize by a minor may require written consent of parent or legal guardian and execution by parent or legal guardian of required documentation. Where offered, trip dates subject to availability; travel must be completed within 12 months of award. Restrictions & blackout dates apply. If a trip is won by a minor, s/he must be accompanied by parent or legal guardian. Winner's traveling companion(s) required to sign liability release. Costs for goods or services not specified are winner's responsibility. No substitution of prizes except by Sponsor due to unavailability. Except where prohibited by law, winners consent to use of their names, hometowns, prizes won & likenesses for promotional purposes without additional compensation. Void where prohibited by law. All federal, state, provincial and local laws and regulations apply. Prize values in U. S. currency. No transfer or assignment of prize permitted. Winners responsible for all taxes on prizes. Sweepstakes registered by Ventura Associates, Inc., 1040 Avenue of the Americas, New York, NY 10018, the independent judging organization & may be presented in different creative presentations by different organizations. Ventura Associates, the independent judging organization has provided all prizes at no charge. Ventura Associates, Inc., reserves the right to modify, suspend, or terminate the promotion if it becomes technically corrupted. Employees of presenting organizations, judges, their respective advertising & promotion agencies & any other person or organization directly involved with the promotion and their respective immediate families and household members are ineligible. Canadian residents, to win, must first correctly answer, unaided, a time-limited mathematical skill testing question administered by mail. Any litigation regarding the conduct and awarding of a prize in this publicity contest by a resident of the province of Quebec may be submitted to the Regie des alcools, des courses et des jeux. Online entry open only to U.S. and Canadian residents, 18 and older. One online entry per e-mail address and per person per day. Online entry deemed made by authorized holder of e-mail address at time of entry. Online entries must be submitted by date specified elsewhere on this website. No online usage required. To enter by mail, hand print your name, address, daytime telephone number, and the internet location where you found these instructions on a 3" X 5" piece of paper. Insert in a #10 envelope and mail to Sweepstakes Entry, PO Box 752, Ellenton, FL 34222-0752. Mailed entry must be postmarked by the deadline posted elsewhere on this website and received within 7 days thereafter.

Emerging Companies to Watch

Methodology: To identify and select the Top 100 Emerging Companies for our special supplement, *Computerworld* invited companies to nominate themselves on our Web site from June 5 through July 14.

To qualify, companies had to be corporate-focused, for-profit ventures with revenue of less than $250 million and founded no earlier than 1995. Qualified candidates also had to have an innovative product or service available by Dec. 31, 2000, and customer references. To be considered, companies had to have a management team in place (rather than one person acting as CEO or vice president of marketing, sales and so on).

Nomination forms were categorized by market. A panel of *Computerworld* editors then reviewed the forms and selected finalists in each market segment.

The finalists' nomination forms were then sent to a panel of information technology industry influencers — senior-level executives who are both providers and users of IT, including Chris Horrocks, CIO at Selecterra Inc.; Tim Byers, CIO at SESCO Inc.; Jeanne W. Ross, principal research scientist at the MIT Center for Information Systems Research; Ann Delligatta, CIO at Autobytel.com Inc.; Irene Dec, vice president of The Prudential Insurance Company of America; Mike Crowley, CIO at Campbell Soup Co.; Dick Hudson, president of Dick Hudson & Associates; Bob Schwartz, vice president and CIO at Panasonic USA; John Puckett, vice president and general manager of wireless and Internet strategies at Polaroid Corp.; Priscilla Tate, director of the Technology Managers Forum; Honorio Padron, president of the business services group at Unicom Corp.; John Voeller, chief knowledge officer, chief technology officer and senior vice president at Black & Veatch; and Alan E. Brill, senior managing director at Kroll Associates.

The panel of IT influencers rated the finalists on the following characteristics:

- The company and its technology offer demonstrable value to corporate IT operations in Fortune 1,000 companies; the

COMPANY NAME	LOCATION	WEB ADDRESS	NUMBER OF EMPLOYEES	YEAR FOUNDED	FOUNDER(S)	PUBLIC OR PRIVATE	PRODUCT(S)/SERVICE(S)
Application development tools							
Crossworlds Software Inc.	Burlingame, Calif.	www.crossworlds.com	270	1996	Katrina Garnett	Public	InterChange Server, application connectors, custom and legacy application integration tool set
Crystallize Inc.	Ann Arbor, Mich.	www.crystallizes.com	73	1998	Helene Abrams	Private	Data Conversion Solution 3.1, Change Key Flexfield Solution 3.1, Supply Chain Optimization Solution 4.2
Data Junction Corp.	Austin, Va.	www.datajunction.com	60	1995	Darrell Blanford	Private	Data Junction 7.0, DJEngine 7.0
Epicentric Inc.	San Francisco	www.epicentric.com	180	1998	Ed Anuff, Oliver Muoto	Private	Portal Server 3.0, Syndicated Services 3.0
Extensibility Inc.*	Chapel Hill, N.C.	www.extensibility.com	45	1998	Reid Conrad, Lee Buck	Private	XML Authority 1.2, XML Canon Beta EA, XML Instance 1.0
Outlook Technologies Inc.	Chicago	www.outlook.net	50	1995	Elias Manousos, Robert Grzywinski	Private	CMS/Media 1.2, CMS/Merchant 1.1, CMS/Core 1.2
Application service providers							
Agiliti Inc.	Bloomington, Minn.	www.agiliti.com	140	1999	Tom Kieffer	Private	Business services, e-commerce services, IT services
Broadreach Consulting Inc.	Wayne, Pa.	www.ebroadreach.com	500	1995	James W. Dixon	Private	Management consulting, applications and infrastructure solutions
CoVia Technologies Inc.	Mountain View, Calif.	www.covia.com	105	1996	Deidre Paknad, Daryoush Paknad	Private	SalesOnline, Intranet Included, Team-Online, BizOnline 2.0, InfoPortal Platform
Genesis10	New York	www.genesis10.com	127	1999	Harley Lippman	Private	IT staff augmentation, project management services, project outsourcing
IBenefits Inc.	El Segundo, Calif.	www.ibenefits.com	270	1997	John Gran	Private	iElect, iAdmin, iWorksite
Interliant Inc.	Purchase, N.Y.	www.interliant.com	1,500	1997	Leonard J. Fassler	Public	INIT ASP Host, INIT Commerce: Channel Commerce Platform Solutions, INIT Collaboration: Defeating Borders
Telera	Campbell, Calif.	www.telera.com	140	1998	Prem Uppaluru, Mukesh Sundaram	Private	Telera Contact Center Connect, Telera Connect, Telera Quick Connect
TellSoft Technologies	Colorado Springs	www.tellsoft.com	70	1997	Shaun McNerney, Paul Carver	Private	iTalkWeb, iTalkLive, iTalkSlides
Customer relationship management							
Annuncio Software	Mountain View, Calif.	www.annuncio.com	235	1997	Didier Moretti, Maurizio Gianola	Private	Annuncio Live 2.1, Annuncio ToGo 1.0, Annuncio Bright 3.0
E.piphany Inc.	San Mateo, Calif.	www.epiphany.com	800	1997	Steven Blank, Elliot (Ben) Wegbreit	Public	E.5 System
Ineto Inc.	Austin, Texas	www.ineto.com	90	1999	Mike Betzer, Alasdhair Campbell, Stephen Michael	Private	Ineto Conductor
IslandData Corp.	Carlsbad, Calif.	www.islanddata.com	50	1995	Guy Jones, Jeff Stanford	Private	ExpressResponse 4.5
Knosys Inc.	Boise, Idaho	www.knosysinc.com	70	1995	Bob Lokken	Private	ProClarity OLAP Client 2.0, ProClarity Analytical Platform 2.0, ProClarity Add-In for Microsoft Excel 1.0
Kovair Inc.	San Jose	www.kovair.com	40	1999	Krishna Subramanian	Private	Kovair VIPCenter Strategic Account 1.0
MarketSoft Corp.	Lexington, Mass.	www.marketsoft.com	75	1998	Greg Erman	Private	eLeads, eOffers
Responsys.com	Palo Alto, Calif.	www.responsys.com	130	1998	Anand Jagannathan	Private	Responsys Interact 2.3, Responsys Jumpstart
RightNow Technologies Inc.	Bozeman, Mont.	www.rightnowtech.com	260	1997	Greg Gianforte	Private	RightNow Web 3.2
Service911.com Inc.	Dallas	www.service911.com	84	1997	Lawrence Schwartz	Private	Webskin 3.0
Talisma Corp.	Kirkland, Wash.	www.talisma.com	465	2000	Pradeep Singh	Private	Online eCRM Suite 2.0, Enterprise eCRM Suite 2.5, Small Business eCRM Suite 2.5

in 2001

product or service addresses problems or challenges that IT managers face.

■ The company is innovative; the product or service presents a new and creative approach to an IT issue and competes in a relatively new or emerging market.

■ The company demonstrates positive signs of an ability to execute its strategy (revenue, revenue growth, funding, management team).

These scores were totaled for each market segment. Companies with the highest scores in each of the market segments were selected for our Emerging Companies list.

PRIMARY MARKET FOCUS
E-business infrastructure software
Oracle applications market software
Data integration software
E-commerce portals and portal networks
E-business software
Back-office infrastructure for Web sites
Rentable application services
Business-to-business services
Hosted Web applications
Software development consulting services
Internet-based human resources software
Hosted applications and Internet professional services
Business communications application services
Phone-to-Internet content and communications solutions
Electronic-marketing software and services
Customer interaction software
Internet communications product
E-mail and Web management software
Business intelligence, online analytical processing services, analytical applications
Relationship management software
B2B and B2C software
Online permission marketing software
Web-based customer service software
Web-based support services
Web-based customer relationship software

PROFILE

Extensibility: Riding the XML Wave

BY ROBERT L. MITCHELL

When consultant Wafa Khorsheed set to work on Dearborn, Mich.-based Ford Motor Co.'s XML-based Build-To-Order project, which will allow the automaker to sell over the Internet, he turned to XML Authority, a software tool from Extensibility Inc. in Chapel Hill, N.C. Khorsheed says he was impressed by the intuitive graphical user interface of the tool, which was designed for creating, managing and converting XML schemas. "It conveys the logic of the schema easily," he says.

"[XML Authority] is a very intuitive, very approachable technology that lets users work at the abstraction level and not get their hands dirty at the code level," explains Extensibility CEO Reid Conrad.

"XML is central to where we see technology going," he adds. "We want to dominate in the XML infrastructure space." Those are big words for a start-up launched in 1998 with just $1.7 million in venture-capital funding. But in the past two years, the company has sold more than 2,500 software licenses to customers such as Pricewaterhouse-Coopers in New York and Sun Microsystems Inc. And it has signed up an impressive list of partners that offer XML Authority with their own products, including such heavyweights as Microsoft Corp., Oracle Corp. and Commerce One Inc. in Pleasanton, Calif.

Extensibility CEO Reid Conrad

"The key to Extensibility is to look at who has adopted them," says Marshall Martin, an analyst at Zona Research Inc. in Redwood, Calif. "These are very inventive companies they partner with. Each has made a build-vs.-buy decision." Another reason for success may be pricing: XML Authority starts at $99.95 for a single-user license.

Computerworld wasn't the only one to notice Extensibility. On Aug. 3, Palo Alto, Calif.-based e-commerce vendor Tibco Software Inc. acquired Extensibility in a stock transaction valued at about $100 million. ▸

PROFILE

Knosys: Casting the Right Team

BY ELLEN FANNING

Some might consider it putting the cart before the horse, but for Bob Lokken, president and CEO of Knosys Inc. in Boise, Idaho, casting the right team of people first and then finding a product to sell was key to launching a successful start-up.

"[It was] a little bit backwards. But the most important aspect of a start-up is its team of people," says Lokken.

Launched in late 1995, Knosys is a spin-off of Boise, Idaho-based Extended Systems Inc., which itself was a spin-off of Hewlett-Packard Co. The founding members, Lokken, Clay Young, Phil Bradley, Gary Braach and Mark Ickes, teamed up to create ProClarity, a front-end analytical application platform for Microsoft SQL Server 7.0 that allows end users to graphically organize and then analyze data over a corporate intranet. ProClarity eliminates the need for intervention by the IT staff, thus reducing installation and maintenance costs.

Bob Lokken, Knosys president and CEO

The Veteran's Administration Hospital in Tacoma, Wash., uses ProClarity to browse a data warehouse of patient information. Jean Laubscher, project manager for the hospital's Consumer Health and Information Performance System development team, says the tool helps end users, including data specialists, executives and quality managers, display patient data for analysis.

"It's a very intensely graphic product that lets you visualize the data. I would contrast it with a flat, black-and-white report with columns and numbers. This is highly visual and rapidly responds to queries. You make your selection and see it displayed immediately," says Laubscher.

Lokken reports that Knosys now employs 75 people and expects revenue growth of 200% over last year's revenue of $2.9 million. An initial round of funding was provided by Pacific Asset Partners.

Howard Dresner, an analyst at Stamford, Conn.-based Gartner Group Inc., says Knosys has "bet the farm" on Microsoft Corp., but adds that isn't a bad bet to make. "[Knosys] is a visionary in the market. Now it's all about execution," he says. ▸

COMPANY NAME	LOCATION	WEB ADDRESS	NUMBER OF EMPLOYEES	YEAR FOUNDED	FOUNDER(S)	PUBLIC OR PRIVATE	PRODUCT(S)/SERVICE(S)
E-commerce							
Acta Technology Inc.	Mountain View, Calif.	www.acta.com	200	1996	Alex Gorelik, Sachin Chawla	Private	ActaWorks RealTime 4.2, Commerce eCaches 1.0, Analytic eCaches 2.0
Blue Martini Software Inc.	San Mateo, Calif.	www.bluemartini.com	235	1998	Monte Zweben	Private	Customer Interaction System 3.1, support services, e-business intelligence services
Cephren Inc.	Palo Alto, Calif.	www.cephren.com	200	1997	Jas Dhillon	Private	ProjectNet 4.0, MarketNet 1.0, PrintNet 1.0
DataCert.com Inc.	Houston	www.datacert.com	30	1998	Eric M. Elfman	Private	ShareDoc 1.0, UPS Document Exchange Invoices 1.0
ECOutlook.com	Houston	www.ecoutlook.com	105	1999	Mark Kingston	Private	SupplierLines, CustomerLines, TransportationLines
Emerald Solutions	Portland, Ore.	www.emeraldsolutions.com	650	1997	Martin Wright, Jerry Grant, Steve Darrow	Private	Strategy services, interactive design services, engineering technology services
GetThere Inc.**	Menlo Park, Calif.	www.getthere.com	350	1995	Dan Whaley, Bruce Yoxsimer	Public	Global Manager 4.6, FlightRez, ePartner
Groundswell Inc.	San Francisco	www.groundswell.net	200	1999	Paul Stich, Dean Alms	Private	Internet consulting services
IPNet Solutions Inc.	Newport Beach, Calif.	www.ipnet-solutions.com	108	1996	Don Willis	Private	EBizness Suite 3.2, eBizness Transact 3.2, eBizness Collaborate 3.2
NetReach Inc.	Ambler, Pa.	www.netreach.com	80	1995	Peter G. Randall	Private	Hosting solutions, application services
Newmediary Inc.	Newton, Mass.	www.newmediary.com	50	1999	Scott Cohen	Private	E-business services
ONEX Inc.	Indianapolis	www.onexinc.com	200	1997	Joseph Huffine, Sally Breen	Private	E-business consulting services
OnLink***	Redwood City, Calif.	www.onlink.com	175	1996	Buck French, Jeffrey Loomans, Patricia Munter	Private	OnLink Sales 3.4, OnLink Surveyor 1.0, OnLink Composer 3.4
Perficient Inc.	Austin, Texas	www.perficient.com	200	1998	Bryan Menell	Public	Virtual Professional Services Organizations, Virtual Education Services Organizations
Saga Software Inc.	Reston, Va.	www.sagasoftware.com	684	1997	Daniel F. Gillis	Public	Sagavista 1.2, Natural 4.1, Adabas 7.1
Ventro Corp.	Mountain View, Calif.	www.ventro.com	463	1997	David Perry	Public	LabPoint, Promedix, Chemdex MarketLink
Xpedior Inc.	Chicago	www.xpedior.com	1,500	1998	Not applicable; formed by a spin-off	Public	Imagine Process, Xpediators, Enterprise eQ
Zefer Corp.	Boston	www.zefer.com	481	1998	Anthony Tjan, Kaming Ng	Private	Consulting services
E-market exchange							
Adexa Inc.	Los Angeles	www.adexa.com	280	1995	K. Cyrus Hadavi	Private	iCollaboration 4.6
Aeonware Inc.	Alpharetta, Ga.	www.aeon-shopping.com	115	1995	Michael Mildenberger	Private	Aeonware MARK/8 Marketplace, Aeonware MARK/8 Hosting, Aeonware MARK/8 Wholesale Manufacturing Procurement
CommerceRoute Inc.	Emeryville, Calif.	www.commerceroute.com	57	1997	Doron Rotem	Private	CommerceRoute 2.0, eBusiness Suite 2.0, Global Connect
CrossCommerce Inc.	San Francisco	www.crosscommerce.com	60	1999	Peter Nordberg	Private	AIM 1.0, Virtual Product Warehouse 1.0, Merchandising Intelligence 1.0
Exterprise Inc.	Austin, Texas	www.exterprise.com	110	1998	Manoj Saxena, S. P. Rana	Private	ActiveMarket 2.0
HelloBrain.com	Santa Clara, Calif.	www.hellobrain.com	60	1999	Joe Tung, Bharat Sastri	Private	Intellectual capital exchange, private exchanges
Logistics.com	Burlington, Mass.	www.logistics.com	140	2000	Yossi Sheffi	Private	Digital Transportation Marketplace 1.0, shipper solutions, carrier solutions
MindFlow Technologies Inc.	Plano, Texas	www.e-mindflow.com	35	1999	Jay Reddy, Mark Griffis	Private	ProcureMind 1.5
Mxi Technologies Ltd.	Ottawa, Ontario	www.mxi.com	56	1996	Brad Forsyth, Doug Brouse	Private	Maintenix 3.2, Expeditor 1.1
Nitorum Corp.	Norwalk, Conn.	www.nitorum.com	98	1999	Kristopher King	Private	Intelli-Gage 2
SingleSourceIT	Columbus, Ohio	www.singlesourceit.com	70	1999	Randy Wilcox	Private	Decision support, acquisition services of IT-related products, asset management of IT-related products
Tradec	San Jose	www.tradec.com	30	1996	John Abe	Private	Tradec Standard 5.0, Tradec with PurchasingPro 5.0, Tradec with SalesPro 1.1
Vitessa Corp.	Seattle	www.vitessa.net	165	1997	David P. Mullan	Private	Vitessa Merchant Exchange 1.5
Internet-based applications							
2netFX	San Jose	www.2netfx.com	20	1996	Eric Yao	Private	HDTV over IP Server & Player, ThunderCast IP Server, StreamRider Player
Activate Corp.	Seattle	www.activate.com	150	1997	Chris Maskill	Private	Active Conference Center 1.1
Backsoft Corp.	Sarasota, Fla.	www.backsoft.com	70	1997	Bert Kastel, Rich Swier	Private	<b>Commerce 2.0, <b>Procurement 2.0, <b>Talk 3.0
Buzzsaw.com Inc.	San Francisco	www.buzzsaw.com	260	1999	Anne Bonaparte, Larry Wares, Carl Bass	Private	Project collaboration, bidding, construction management
CUseeMe Networks	Nashua, N.H.	www.cuseemenetworks.com	125	2000	Killko Caballero	Public	V2ASP, CUseeMe World, Videochat Your Site
Delano Technology Corp.	Markham, Ontario	www.delanotech.com	422	1998	Bahman Koohestani	Public	Delano e-Business Interaction Suite 2.5, Delano Customer Velocity 2.0
ERoom Technology Inc.	Cambridge, Mass.	www.eroom.com	174	1996	Jeffrey Beir, Pito Salas	Private	eRoom 4.2, professional services
EYak Inc.	Boston	www.eyak.com	60	1999	David Friend, Jeff Flowers	Private	eSEE

PRIMARY MARKET FOCUS
Enterprise resource planning software services
Manufacturing and retail industry software
Web-based services for global construction industry
E-business services for information exchange
Web-based supply-chain software
E-business services
Internet marketplace for business-to-business travel services
E-business communities
Online transaction management infrastructure
E-business solutions for business-to-business and business-to-consumer
Online marketplaces for e-business services
High-tech consulting for e-business
Internet sales and marketing applications
Services for Internet software companies
Enterprise application integration software
Business-to-business e-commerce services
End-to-end e-business solutions
Internet strategies and solutions provider
Collaborative commerce software and services
Software for business-to-business and business-to-consumer markets
Software that provides mass connectivity of trading partners
Software that automates core e-commerce business practices
Software platform for business-to-business marketplaces
Intellectual capital exchange for the high-tech industry
Transportation procurement and management services
Purchasing software
Aircraft maintenance management software
Business-to-business electronic-procurement application
Web-based IT lifecycle management solution
Supply-chain hub for the electronics industry
E-commerce network for Web sites
Broadband Internet and intranet network solutions
Webcasting software
E-business supply- and buy-side applications
Business-to-business tools and services for the building industry
Interactive voice and visual communications
Interaction-based e-business solutions
Internet collaboration software
Voice network application

PROFILE

Xpedior: Developing E-Business Strategies for Customers

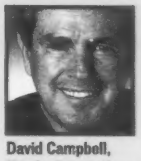
BY MELISSA SOLOMON

Allstate Insurance Co. needed to get a handle on its project management. But when the company put out a bid for an information technology consultant to help create a Web-based application, just a few firms responded.

And among those, the only contender "who had a keen interest in developing a relationship with us was Xpedior," says Andy Rieder, assistant vice president at the Northbrook, Ill.-based insurance company.

Xpedior Inc. got the job, and, with the system scheduled to go live this month, Rieder says he has no regrets about his choice. "They've been very cooperative, and they haven't disappointed us in terms of quality or cost," he says.

David Campbell, president and CEO of Chicago-based Xpedior, says the key to the company's success is its ability to customize electronic-business strategies for companies. "[We look at] how people can do their business differently because the Internet exists," he says.



David Campbell, Xpedior's president and CEO

Xpedior works with companies to examine hundreds of processes, like recruiting, planning, distribution and procurement, to see if there are new or refined ways of handling those tasks in an e-commerce world.

The company, formerly a division of Metamor Worldwide Inc. in Houston, was founded three years ago but went public just last December. With 1,700 employees and customers such as Bell Canada International Inc. in Montreal, Citibank in New York and Hewlett-Packard Co., Xpedior stands out as one of the leaders in its industry, says Andy Efstathiou, an analyst at The Yankee Group in Boston.

"The good news about them is they've grown solely by organic growth rather than by buying," he says, which has allowed the company to develop a single corporate culture.

PROFILE

HarvestRoad: Targeting New Markets

BY LEE COPELAND

After netting a $15 million bounty from an initial public offering on the Australian Stock Exchange last September, Perth, Australia-based HarvestRoad Ltd. is ready to expand into the Asian markets.

Grame Barty, HarvestRoad's founder

Founded in 1996 by Grame Barty, a former telecommunications executive at Nortel Networks Corp., the start-up develops software tools that automate the creation of Web portals and community sites.

HarvestRoad's flagship product, WebPower, is a suite of four applications: a wizard-driven tool for setting up a Web site, a tool for publishing documents to the Web, a document management application and an e-commerce engine. All the applications in the WebPower suite are accessible via a Web browser and are available on Sun Solaris, Unix or Linux operating systems.

Barty, managing director at HarvestRoad, says he believes support for Linux will drive adoption of the new product in China, India and Malaysia, the three markets his company is targeting. Barty also notes that the product's relative ease of use drove its adoption in Australia.

Helen Thompson, a project leader at The Electronic Chamber of Commerce in Victoria, Australia, says WebPower enabled the nonprofit organization to create and launch its portal site in four months. "The tools are very easy to use, and that's why we've found them attractive," says Thompson. "Normal people, not those with IT specialist skills, are maintaining the site, and it's easy for them to regularly publish and update information."

The organization also trains business members to create auxiliary sites, which link to the main portal, with HarvestRoad's tools.

Barty estimates that 80% of the firm's $2.4 million in revenue last year came from Australia, while the remaining 20% was derived from Asian markets. Barty says he hopes to double sales abroad by next year and operate in the black by next October.

The company employs 68 people and posted an income loss of $3 million for its fiscal year ended June 30.

COMPANY NAME	LOCATION	WEB ADDRESS	NUMBER OF EMPLOYEES	YEAR FOUNDED	FOUNDER(S)	PUBLIC OR PRIVATE	PRODUCT(S)/SERVICE(S)
Internet-based applications (continued)							
FinTrack Systems Corp.	New York	www.fintrack.com	50	1997	Murugan Manivanan	Private	Equity Trading System 1.2, Derivative Trading System 1.0, Fixed Income Trading System 1.0
Google Inc.	Mountain View, Calif.	www.google.com	115	1998	Sergey Brin, Larry Page	Private	Web Search, Google Site Search
HarvestRoad Ltd.	Claremont, Western Australia	www.harvestroad.com	60	1996	Grame Barty	Public	HarvestRoad Wizard 2.0, HarvestRoad Publisher 1.3, HarvestRoad DPMS 1.2
IDFM Inc.	Burlington, Mass.	www.idfm.com	28	1996	Steve Parrella	Private	Process Innovator 3.0
NetDecide Inc.	Falls Church, Va.	www.netDecide.com	50	1996	C. C. Chang	Private	Decision Server, AdvisorDecide/Personal Decide/PlannerDecide, IntelliDecide
OpenReach Inc.	Wakefield, Mass.	www.openreach.com	60	1999	Mark Tuomenoksa	Private	TrueSpan
Saba Software Inc.	Redwood Shores, Calif.	www.saba.com	460	1997	Bobby Yazdani	Public	Saba Learning Enterprise, Saba Learning E-Store 4.0, Saba Learning Exchange 4.0
Mobile and wireless							
Etrieve Inc.	Hillsboro, Ore.	www.etrieve.com	30	1998	Mike Maerz, Ash Gupte	Private	M3 Mobile Message Management 1.0
W-Trade Technologies Inc.	New York	www.w-trade.com	160	1997	Donna R. Oliva, Sergey Fradkov	Private	w-Trade Wireless Securities Trading 4.01, w-Bank Wireless Banking 4.01, w-Store Wireless e-Commerce 1.0
Wysdom Inc.	Richmond Hill, Ontario	www.wysdom.com	175	1998	Kashif Hassan	Private	mMobilize, mPortal, mShop
XcelleNet Inc.	Atlanta	www.xcellenet.com	265	2000	D. Crumpler	Private	RemoteWare, Afaria
Network systems management							
Aelita Software Corp.	Powell, Ohio	www.aelita.com	120	1998	Ratmir Timashev	Private	Domain Migration Wizard 5.0, Enterprise Directory Reporter 4.0, ERDisk 5.0
DataCore Software Corp.	Fort Lauderdale, Fla.	www.datacoresoftware.com	125	1998	George Teixeira	Private	SANsymphony 1.0
Ecora Corp.	Portsmouth, N.H.	www.ecora.com	41	1999	Alex Bakman	Private	Ecora Documentor 1.0, My Ecora 1.0
Entelagent Software Corp.	Agoura Hills, Calif.	www.entelagent.com	24	1996	John D'Angelo	Private	SAMS Surveillance System 2.2, SAMS E-Mail Warehouse 2.1
Netarx Inc.	Bingham Farms, Mich.	www.netarx.com	30	1997	Sandy Kronenberg	Private	NMS Remote Network Monitoring 1.0, The Ticketer 4.0, RESNet 2.0
Netier Technologies Inc.	Carrollton, Texas	www.netier.com	75	1997	James V. Crocco	Private	NetXpress Information Appliances XL1/2000, Rapport Administrative Software 2.0, Application Embedding Services 1.0
Orillion Corp.	Houston	www.orillion.com	114	1995	Jerry R. Sellers, Terry P. Lindsey	Private	OVista 4.1, OVantage 2.0
Response Networks Inc.	North Andover, Mass.	www.responsenetworks.com	50	1999	Ivan Shefrin	Private	ResponseCenter 2.5
Security							
Arcot Systems Inc.	Santa Clara, Calif.	www.arcot.com	100	1997	Ram Varadarajan	Private	Arcot WebFort 3.0
Authentica Inc.	Waltham, Mass.	www.authentica.com	35	1997	David Pensak	Private	PageVault, WebVault, MailVault
BioNetrix Systems Corp.	Vienna, Va.	www.bionetrix.com	75	1997	Peter Bianco, Karl Ware	Private	The BioNetrix Authentication Suite 3.1
Sanctum Inc.	Santa Clara, Calif.	www.sanctuminc.com	90	1997	Eran Reshef	Private	AppShield 2.5, AppScan 1.0, AppAudit
Securant Technologies Inc.	San Francisco	www.securant.com	105	1997	Jonti McLaren, Eric Olden	Private	ClearTrust SecureControl 4.2
Web infrastructure							
Adero Inc.	Boston	www.adero.com	240	1998	Paul Cheng, Robert Carney	Private	GlobalWise 1.5
CacheFlow Inc.	Sunnyvale, Calif.	www.cacheflow.com	350	1996	Michael Malcolm	Public	CacheFlow Internet Caching Appliances 3.0, CacheFlow Content Manager 1.0, RealProxy for CacheFlow 1.0
CoreExpress Inc.	St. Louis	www.coreexpress.com	150	1999	Michael Gaddis	Private	Internet Data Exchange System 1.0
Evoke Communications Inc.	Louisville, Colo.	www.evoke.com	456	1997	Paul Berberian	Private	Evoke Webconferencing, Evoke Webcasting, Evoke Talking Email
Interwoven Inc.	Sunnyvale, Calif.	www.interwoven.com	480	1995	Peng Ong	Public	TeamSite 4.2, OpenDeploy 4.2, TeamSite Templating 4.2
Kinecta Corp.	San Francisco	www.kinecta.com	110	1998	David Mathison, Adam Souzis, Arthur Do	Private	Kinecta Interact 3.0 (includes Kinecta Interact Server and Kinecta Interact Subscriber) 3.0, Kinecta TrafficRegister 3.1
Nishan Systems	San Jose	www.nishansystems.com	100	1998	Aamer Latif	Private	SoIP, Series 2000, Series 3000
Packeteer Inc.	Cupertino, Calif.	www.packeteer.com	120	1996	Brett D. Galloway, Robert L. Packer	Public	PacketShaper 4.1, AppVantage 4.2, Application Acceleration Line 1.0
ProactiveNet Inc.	Alviso, Calif.	www.proactivenet.com	82	1997	Ajay Singh	Private	ProactiveNet 3.5
TopTier Software Inc.	San Jose	www.toptier.com	200	1995	Shai Agassi	Private	TopTier eBusiness Integration Portal 3.0
VMware Inc.	Palo Alto, Calif.	www.vmware.com	89	1998	Mendel Rosenblum	Private	VMware 2.0 for Windows NT and Windows 2000/VMware 2.0 for Linux 2.0.1, VMware server products
Yipes Communications Inc.	San Francisco	www.yipes.com	200	1999	Peter Kaminski	Private	Yipes MAN 1.0, Yipes NET 1.0, Yipes WAN 1.0

NOTE: * Extensibility was acquired by Tibco Software Inc. in August. ** GetThere is under agreement to be acquired by Sabre Holdings Corp. *** OnLink was acquired by Siebel Systems Inc. in August.

PRIMARY MARKET FOCUS
Internet-based trading systems
Internet search software
Virtual community software
Internet software solutions
Web-based financial software
Internet-based business communications software
Learning management software and services
Mobile e-mail services
Wireless software and mobile business solutions
Global wireless Internet access provider
Enterprisewide strategic management software
Microsoft-centric directory and systems management software
Network storage software
Network infrastructure software
E-mail content management systems
Network infrastructure software
Networked computing devices and network management software
Systems and technical solutions for telecommunications carriers
E-business management software
Security software for Web-based applications
Internet security software
Security software
Web application security and control software
E-commerce software
Global turnkey services for online
Internet-caching appliances
Extranet infrastructures
Internet communication services
Web site software and services
Internet content aggregation platform
Storage networking products
Internet application infrastructure
E-commerce software
Enterprise information portal technology and products
Desktop and server software
Scalable bandwidth provider

PROFILE

Response Networks: Tracking Web App Performance

BY MARK HALL

Dick Vandenberg thinks his scalded-dog theory explains why Alexandria, Va.-based Response Networks Inc.'s service-level agreement management tools will make the transition from the S/390 mainframe, where he uses them now, to the Internet.

The vice president and manager of branch automation at First Tennessee Bank NA in Memphis says that in the world of service-level agreements, subjectivity is unacceptable but inevitable among end users. "So I need to know whether the application is running like a scalded dog or slowing everyone down big time." And the cold, hard facts he gets in reports from the vendor's response center let him know precisely how things are running.

Pulsar, the latest product entry from Response Networks, uses Jini and Java technology to report on application response time across the Internet. Response Networks is licensing Pulsar to large Internet providers that will offer the service to users like First Tennessee Bank, which has already done some testing with the product.

Founder Ivan Shefrin: Thinking ahead

CEO Ted Joseph: Solid business plan

John McConnell, principal analyst at McConnell Associates in Boulder, Colo., says, "They've got a real solid business plan and technology."

Richard L. Ptak, an analyst at Hurwitz Group Inc. in Framingham, Mass., agrees, adding that Response Networks founder Ivan Shefrin and CEO Ted Joseph are impressive managers. "I speak to a lot of bright people in the industry, and Response Networks has some of the most exciting, leading-edge thinkers in the industry," Ptak says.

That technology and management combination inspired a recent multimillion-dollar investment from Cisco Systems Inc. According to Cisco Vice President Eugene Lee, Response Networks has strategic technology in an area the San Jose-based networking giant "wants to learn about."

PROFILE

Arcot Systems: Securing Web Identities

BY LEE COPELAND

Founded in 1997, Arcot Systems Inc. makes software that tackles the tricky task of verifying digital identities on the Web. The Santa Clara, Calif.-based start-up sells its Internet security software to e-commerce, health care and financial companies.

Arcot's WebFort software combines digital certificate technology with an encrypted security key technique called Cryptographic Camouflage, which works by hiding a user's encrypted security key among several fake keys. In competing security systems, an encrypted key can be decrypted by searching through the key space for one authentic, readable key. In Arcot's security scheme, all the keys in the key space are readable, but only one unlocks access to a Web account. After three failed attempts, the user or potential hacker gets locked out of the system.

Chet Silvestri, CEO of Arcot Systems

"It's similar to leaving 1,000 keys beneath the doormat," says Marlin Gilbert, vice president of business development at Arcot. "All the keys look like they fit the lock, so the thief has to go through each one to find the right fit."

James Hurley, an analyst at Aberdeen Group Inc. in Boston, says Arcot's technique would foil a potential hacker through sheer exhaustion. "The time required to guess all 1,000 keys would take a lifetime," he says.

Chet Silvestri, former president of Sun Microsystems Inc.'s microelectronics unit, was brought in as CEO of Arcot in July. In August, Arcot raised $21 million in fourth-round funding, bringing its venture capital total to more than $40 million.

The company employs 125 people.

FRANK HAYES/FRANKLY SPEAKING

Taking the Gamble

›› How to choose an emerging company survivor.

Face it: New technologies are a gamble. And choosing an emerging company as a vendor is an even bigger gamble. When we peg IT plans on a new or rapidly evolving supplier, we aren't just betting on that vendor's ability to deliver. We're also betting on its survival.

So why do it? Why take the gamble? The answer goes to the core of what IT means in business today. Corporate IT is where increased productivity, efficiency and effectiveness must come from. If we in IT can't deliver more, better, faster, cleaner, more timely and more useful information — well, we'll be swept away by competitors, by new ideas, by alternatives we never saw coming.

Same-old, same-old won't do it. Either we find new ways to use existing technologies, or find new technologies.

Like with any gamble, there's risk. But the more questions you can answer, the better the chance that gamble will pay off.

Ask yourself — and them:

- Will this vendor survive? How's the capitalization? What's the burn rate? How quickly is the vendor collecting customers? Great ideas and technical talent do you no good if the vendor goes belly up.
- Will the products you buy continue to be developed? Small vendors like focusing on one thing at a time. If this vendor is suddenly more enthusiastic about a new, different product, you could be facing a dead end.
- Will these products continue to be supported? Maybe a dead end is OK — but only if you can get the source code, hardware specs and other information you'll need.
- If this vendor is bought by a larger company, will you be forced to switch to the larger vendor's product line?
- Is the infrastructure in place — training, user groups and consultants who know the product — to support you?
- Are third-party vendors on board? Their commitment is a good sign that they think your emerging company's product will survive. Remember, successes travel in packs.
- What are this vendor's plans to license out its new technology? No, not this year — but down the line, it's in your interest to have multiple suppliers. And unless they can grow faster than the market, you could find yourself with Betamax technology in a VHS world.
- Or is this vendor more interested in licensing than producing products and building market share? Maybe you should look to one of its licensees instead. You want a product, not a loss-leader from an idea factory.
- If the product is hardware, who's actually manufacturing it? Quality matters, and you want some experience behind how it's built. Start-ups can buy that experience by farming out manufacturing to a third party, or by bringing in expertise through their management team. But make sure *somebody* knows how not to build lemons.
- Finally, what do your own technical people think? They'll have to learn, implement and maintain the product. They hear scuttlebutt, and they know what's failed before. If they think it's a dog, it probably will be for your company. And no matter how well it works somewhere else or how good this bet looks on paper, that's a gamble you can't afford. ◗

Hayes, Computerworld's senior news columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

POPS& DROPS

Last April's technology stock sell-off may have put a damper on initial public offerings (IPO), but while the number of tech companies going public has dipped, the money being raised is holding steady compared with last year. Take a look at these IPO stats:

›› In 1999, **543** companies went public. As of last month, **396** companies had gone public.
SOURCE: THE WALL STREET JOURNAL

›› IPOs have raised **$73.7 billion** as of last month, compared with **$68.8 billion** in all of 1999.
SOURCE: THOMSON FINANCIAL SECURITIES DATA

›› First-day price pops averaged **64%** as of August, down slightly from last year's **68%** average first-day gain.
SOURCE: THE WALL STREET JOURNAL

›› Percentage of *Computerworld*'s 100 Emerging Companies to Watch 2001 that were public when they were chosen for this year's list: **15%.**

›› Percentage of companies that were public when *Computerworld* chose them for Emerging Companies 2000: **12%.**

Best first-day IPO in overall market for 2000

›› **WebMethods Inc.** went public February at an offer price of $35. Its first-day close was $212.63, for a return of **508%.**

Best first-day IPO in overall market for 1999

›› **VA Linux Systems Inc.** went public December 1999 at an offer price of $30. Its first-day close was $239.25 for a return of **698%.** SOURCE: HOOVER'S ONLINE

Best first-day IPO for Emerging Companies 2001

›› **CacheFlow** went public November 1999 at an offer price of $24. Its first day close was $126.38, for a return of **427%** (and it continued to shine; its third-quarter 2000 close gave a 496% return).

Best IPO in the overall market for 2000

›› **Marvell Technology** went public in June at an offer price of $15. Its price in October was $84.56, a return of **463.8%.**

Best IPO in the overall market 1999

›› **Commerce One Inc.** went public July 1999 at an offer price of $21. Its end-of-year price was $196.50, for a return of **2,707%.**
SOURCE: HOOVER'S ONLINE

Best IPO Among Emerging Companies 2001

›› **Interwoven Inc.** went public October 1999 at an offer price of $17. Its third-quarter 2000 close was $113, for a return of **565%.**

e-reliable

It's what you can expect from Emtec's e-Business solutions.

When it comes to waging business on the Internet, remote or otherwise, what level of 'e-readiness' is your enterprise?

At Emtec, our customers have come to rely on us to implement cost-effective e-infrastructure solutions, on time, every time! Solutions that offer the high-performance, scalability, and reliability needed to meet the demands of e-Business. We utilize industry-leading e-Business platforms including Sun Microsystems™ Enterprise™ 220 to Enterprise 10K servers to build the world-class e-infrastructure solutions our customers have come to depend on.

Whether solving legacy networking problems or providing seamless e-Business solutions, we specialize in simplifying the complex. How? By utilizing the project management and technical skill sets we've gained over the past 20 years to make your transition into e-Business an easy-to-understand, comfortable process. Emtec brings a level of confidence, expertise and support that can only come from years of experience in the field.

Find out how Emtec can implement an e-reliable, e-Business solution for your enterprise. Contact us today at **ebiz@emtecinc.com** or call **1-877-410-4999 ext. 605.**

Sun iFORCE™ REGIONAL SYSTEM PROVIDER

www.emtecinc.com

emtec inc
e-business simplified

© 2000 Emtec, Inc. All rights reserved. Sun, Sun Microsystems, the Sun Logo, and Sun Enterprise are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries.

Did you really pay all that money to a network administrator

to reset passwords?

Forgotten passwords cost companies money. Big money. In fact, it's estimated password management costs American business at least $200 per person per year.

Integrated with a middleware product, Iridian Technologies' new Authenticam™ with Private ID™ software eliminates password problems forever while enhancing information security. A solution that can pay for itself in as little as one year while limiting access to sensitive information to authorized personnel.

Authenticam uses iris recognition, the most accurate, stable, scalable, and non-invasive human authentication technology in existence. Iridian's exclusive Private ID™ provides the ultimate in security and user privacy.

Easy and convenient to use, controlled access to workstations, servers, LANs and WANs starts with a glance at a camera 18-20 inches away. Authenticam also incorporates high-resolution videoconferencing, facilitating collaboration and adding multi-level secured communications simply not available with other authentication devices at any price — let alone for the price of a regular videoconferencing camera.

Authenticam and Private ID can help manage IT related costs while enhancing information security.

For more information call 1-866-IRIDIAN or see www.iridiantech.com.

Authenticam™
with

For a demonstration of the Authenticam with Private ID, visit us at COMDEX Booth L963

iridian™
technologies

Authentication solutions for a new economy

9 East Stow Road, Suite F, Marlton, NJ 08053-3159 USA
1 866 IRIDIAN www.iridiantech.com

Iridian Technologies, the Iridian Technologies logo, the blue "id" ball, Authenticam and Private ID are all trademarks of Iridian Technologies Inc. Iridian Technologies was formed in September 2000 as the successor to the merged entities formerly known as IriScan, Inc. and Sensar Corporation. The company is incorporated in Delaware, U.S.A.

© 2000 Iridian Technologies. All rights reserved.

Should You Strike Back?

Hacking tools are proliferating among non-hacking tech products. But when should you be an online vigilante, and when should you wait for the law? By Deborah Radcliff

LATE ONE NIGHT, a lone, armed figure breaks into an unmanned lobby. A voice overhead tells him to stop and await his arrest. Seeing no one, the spy darts toward the elevator. Thirty miles away, a security guard fires an encrypted command over the Internet. A second later, the lobby explodes in a spray of bullets.

There's a war brewing in cyberspace. Make that a Netwar, so dubbed in *Countering the New Terrorism*, a book published last year by The RAND Corp., a Santa Monica, Calif.-based nonprofit research group formed during World War II.

It'll be a long time before remote-controlled robots fight battles to keep intruders out of office buildings (though unconfirmed reports circulated among security newsgroups in September did claim that a company in Thailand has invented a gun-toting robot directed through a remote-controlled camera).

But many players, including the government, RAND and Winn Schwartau, a security analyst in Seminole, Fla., say this information war is already upon us. And in his Internet survival book, *Cybershock*, Schwartau claims that some private corporations are already launching military-style counterattacks to protect their interests.

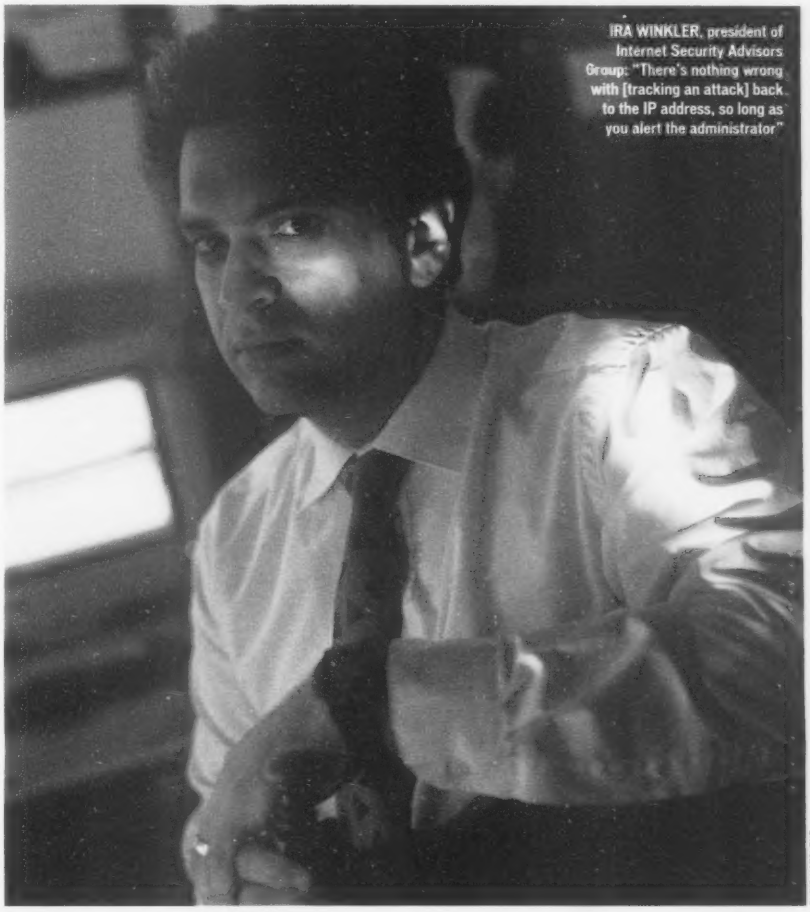
Rumors and off-the-record tales abound, but there has been only one recorded account of a true military-style cybercounterstrike from the corporate sector.

It happened during the World Trade Organization (WTO) summit in January. San Jose-based Conxion Inc., which hosted the WTO server, was hit by a denial-of-service attack launched by the Electrohippies (E-hippies), a U.K.-based online activist group.

Conxion traced the IP trail directly back to the E-hippies server and read postings encouraging E-hippies to mail-bomb the WTO. Instead of dropping those incoming packets at the router like most companies do to stop denial-of-service attacks, Conxion volleyed them back at the E-hippies server, swamping it for several hours. Conxion was so proud of its defensive tactics that it issued a press release.

Chris Malinowski, the recently retired lieutenant commander of the New York Police Department's Computer Crime Squad, says "returning mail to sender" doesn't constitute a crime. But many infor-

Continued on page 74



IRA WINKLER, president of Internet Security Advisors Group: "There's nothing wrong with [tracking an attack] back to the IP address, so long as you alert the administrator."

CHRIS HARTLOVE

Should You Strike Back?

mation technology professionals say they wouldn't risk taking such an action, even if they had explicit proof of the source of the attack.

The chief concern is accidentally slamming innocent sites through which hackers have routed their attacks to conceal their tracks.

"My fear scenario is that U.S. government agencies [involved in information warfare] will build in react capabilities," says John Pescatore, an analyst at Gartner Group Inc. in Stamford, Conn. "A smart hacker will launch a [denial-of-service] attack using those agencies' IP addresses, and they all start attacking each other. The worst case is Amazon shoots eBay who shoots the IRS who shoots Cisco who shoots . . ."

Another concern is liability.

"Launching a counterattack is very difficult because of all the liability issues that come up," says Pete van de Gohm, director of information asset protection at Enron Energy Services Inc. in Houston. "Like, what if the attack comes from a boundary outside the United States and I act against it? Does that constitute an act of war?"

Richard Power, an editor at the San Francisco-based Computer Security Institute, says most company executives with fiduciary responsibilities to their stockholders, government regulators and attorneys would never expose themselves to civil and criminal charges by allowing counterattacks.

Although no hot information war has broken out yet, there are clear indicators in the vendor and IT communities that IT security is shifting beyond passive firewall protection to a more active defense.

"I'm not sure about fighting back in terms of [counterattacking], but in terms of defending yourself, we're just beginning to scrape the surface of defensive measures and tools," says Ruth Lestina, a specialist in information security at Predictive Systems Inc., a New York-based systems integrator.

Defensive Tactics

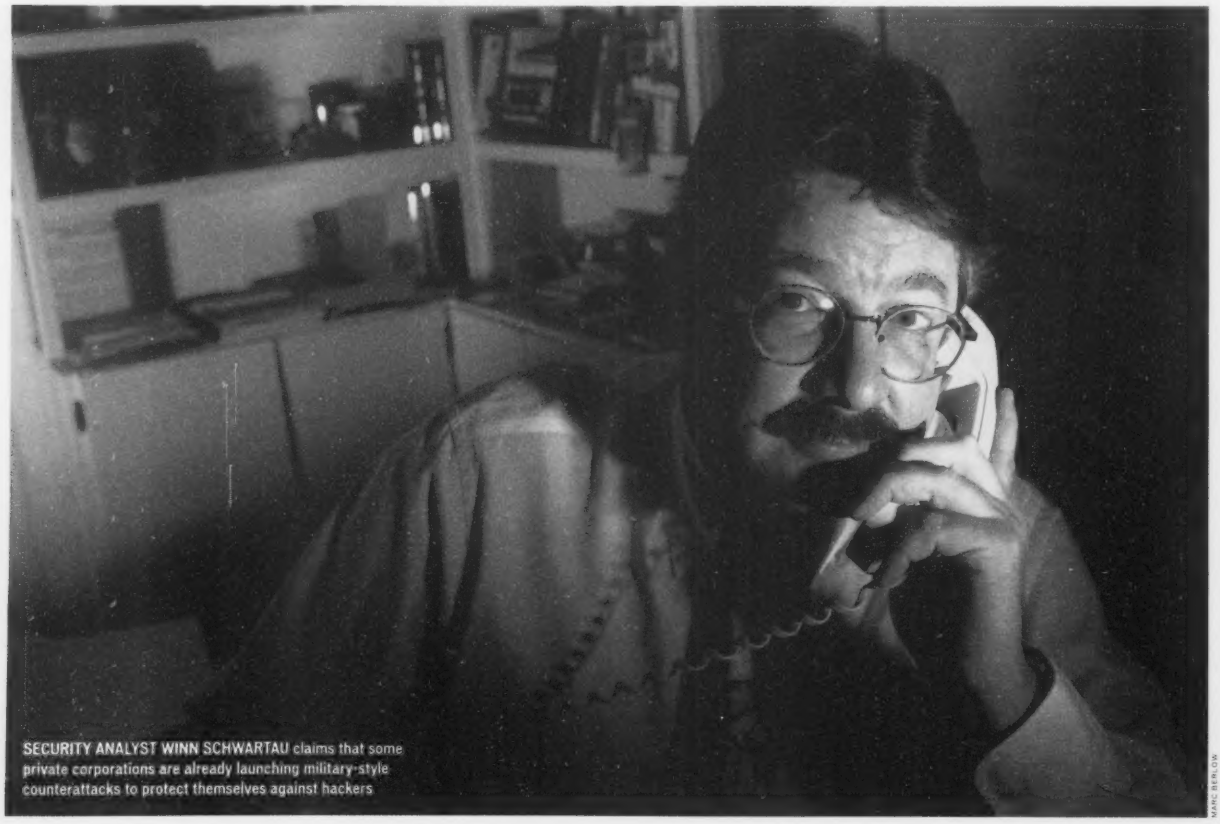
Tool vendors are beginning to push hacker traps and tracers. Network Ice Inc., Recourse Technologies Inc. and Network Flight Recorder Inc. (NFR) all market IP tracking tools that can trace the route of an attack. They also offer decoy network boxes (fondly referred to as "honey pots") that identify an attack and limit it to a punching-bag server that looks like the larger network but isn't connected to it.

In addition, some Linux products, as well as the FreeBSD open-source Unix variant, ship with full bags of hacking tools, including Trojan horses (hidden executable programs) and port scanners that can be used to trace the techniques and footprints of the hackers involved in an attack.

> Launching a counterattack is very difficult because of all the liability issues.
>
> **PETE VAN DE GOHM, DIRECTOR OF INFORMATION ASSET PROTECTION, ENRON ENERGY SERVICES INC.**

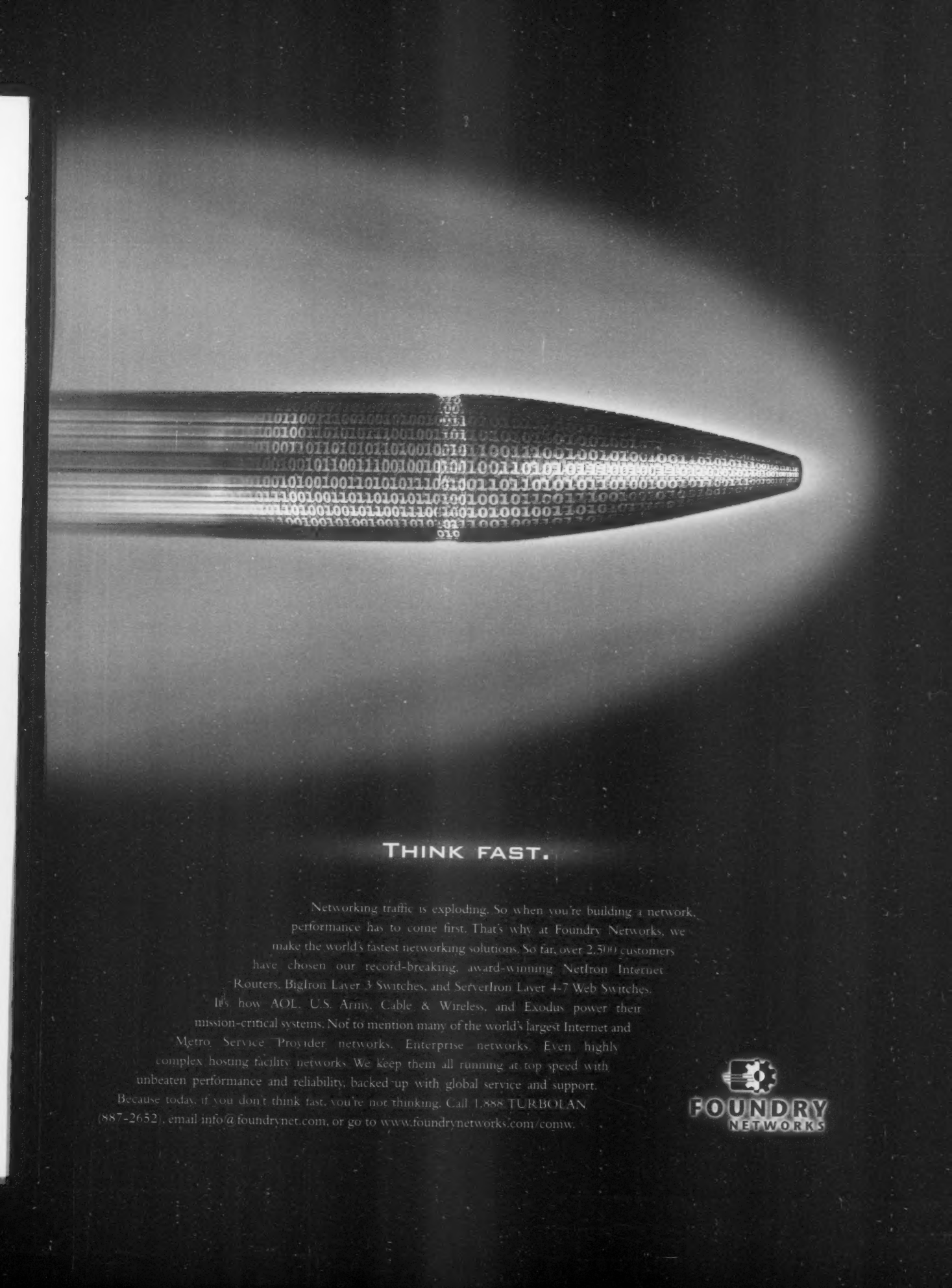
Rockville, Md.-based NFR, which markets its products as "clue-gathering tools for network and security managers," offers a souped-up intrusion-detection system that includes a "network forensics" element with data-traffic analysis and limited trace-back capabilities. NFR also has a product called BackOfficer Friendly, which sets

Continued on page 78



SECURITY ANALYST WINN SCHWARTAU claims that some private corporations are already launching military-style counterattacks to protect themselves against hackers

MARC BERLOW


THINK FAST.
Networking traffic is exploding. So when you're building a network, performance has to come first. That's why at Foundry Networks, we make the world's fastest networking solutions. So far, over 2,500 customers have chosen our record-breaking, award-winning NetIron Internet Routers, BigIron Layer 3 Switches, and ServerIron Layer 4-7 Web Switches. It's how AOL, U.S. Army, Cable & Wireless, and Exodus power their mission-critical systems. Not to mention many of the world's largest Internet and Metro Service Provider networks. Enterprise networks. Even highly complex hosting facility networks. We keep them all running at top speed with unbeaten performance and reliability, backed up with global service and support. Because today, if you don't think fast, you're not thinking. Call 1.888.TURBOLAN (887-2652), email info@foundrynet.com, or go to www.foundrynetworks.com/comw.
FOUNDRY
NETWORKS

Windows 2000 ADVANTAGE

The Web Magazine for IT Leaders Implementing Windows 2000 and Windows NT with Compaq Services and Solutions

Online this week:

POINT OF VIEW

The TaskSmart N-Series: Compaq and Microsoft redefining enterprise storage

Based on Microsoft Windows 2000 the new TaskSmart N-Series Network Attached Storage (NAS) appliance from Compaq makes it easy to deploy and manage advanced file storage.
www.windows2000advantage.com/pov/09-29-00_tasksmart.asp/300

TECH EDGE

Microsoft and Compaq take aim at ASP model

Microsoft and Compaq were at the recent IDG ASP World Conference with an impressive array of product and support offerings. This article looks at Microsoft and Compaq and the rapidly emerging ASP environment.
www.windows2000advantage.com/tech_edge/10-25-00_aim_at_asp.asp/300

Q & A

Microsoft VP Jim Ewel portrays Windows 2000's role in the business Internet

Jim Ewel, vice president, Windows .NET server marketing, has played an important role in some of Microsoft's prominent products. He discusses initiatives, which revolve around Windows 2000 and .NET.
www.windows2000advantage.com/qa/10-06-00_role.asp/300

COLUMNS

Implementing service levels key to .NET success

Microsoft recently unveiled its .NET platform in San Francisco. The .NET platform evolves the current DNA programming model into one that is more in tune with the World Wide Web.
www.windows2000advantage.com/columns/10-23-00_service.asp/300

CASE STUDIES

Windows 2000 fever can be infectious. Just ask Datareturn.com

After testing Microsoft Windows 2000 Advanced Server as part of Microsoft's Joint Development Program, Datareturn.com lost no time migrating its own Web site and customers' shared Web servers.
www.windows2000advantage.com/case_studies/09-18-00_infectious.asp/300

NEWS >

Compaq servers asserting worldwide sales superiority, topping TPC-C benchmark tests

Compaq servers are generating more and more momentum while riding the Windows 2000 wave. Their quarterly market share of unit shipments recently rose 4.4% from Q1 2000 to Q2 2000 throughout the world and ProLiant-based systems are dominating the TPC-C benchmark performance record books, where they currently occupy five of the top 10 slots. As a result of this positive trend, industry observers are increasingly regarding Compaq as a leading PC and server company, not just a leading PC company.

For the full story, visit: www.windows2000advantage.com/momentum/11-06-00_servers.asp/300

CASE STUDY >

Windows 2000 Group Policy can cut support costs, but requires up-front planning, training and testing

The Group Policy features within Microsoft Windows 2000 can make it easier to fine-tune user access rules and even lock down desktops so users can't fiddle with their systems. But moving to Group Policy from the Microsoft Windows NT 4.0 domain structure requires a lot of planning, training and testing.

For the full story, visit: www.windows2000advantage.com/case_studies/11-06-00_grouppolicy.asp/300

MOMENTUM >

As Windows 95 phases out, Microsoft and Compaq offer tools to ease the move to Windows 2000 Professional

Five years after its introduction, Microsoft Windows 95 is nearing retirement. For business customers still running Windows 95, upgrading to Microsoft Windows 2000 Professional will create far more stable and manageable client workstations. Microsoft and Compaq are offering a variety of software tools and services to ease the inevitable migration pains.

For the full story, visit: www.windows2000advantage.com/momentum/11-06-00_95phaseout.asp/300

www.Windows2000Advantage.com/300

MOMENTUM SERIES >

Compaq's FutureSourcing manages Windows 2000, heterogeneous network infrastructure

FutureSourcing is Compaq's collaborative approach to helping companies deliver business results by providing IT infrastructure management services. With FutureSourcing, Compaq minimizes the client company's risk of managing new technology by providing resources that leverage new technology, speed time to market and reduce constant retraining.

The specific desktop, applications, Internet and enterprise infrastructure operations management services offered by Compaq's FutureSourcing professionals include the following:

- Implementation and management of Microsoft Windows 2000 and other enterprise applications
- Rapid deployment of networked infrastructure to support new environments
- Operations management of enterprise networks
- Custom help-desk services

With Compaq Global Services' methodology, FutureSourcing offers customers specific benefits, such as the following:

- Agility – Enabling customers to respond quickly to changing business opportunities and conditions
- Focus – Enabling customers to spend more time on where they need to go and less time on how they get there
- Value – Accelerating ROI by leveraging Compaq expertise, experience, resources and economies of scale
- Control – Gaining control through standardization
- Results – Achieving immediate objectives, while establishing a flexible framework for long-term advantage

For the full story, visit: www.windows2000advantage.com/momentum/10-23-00_futuresourcing.asp/300

QUOTE OF THE WEEK >

"Third-party vendors all say they're Windows 2000 ready, but if you don't do a test, you'll be in trouble."

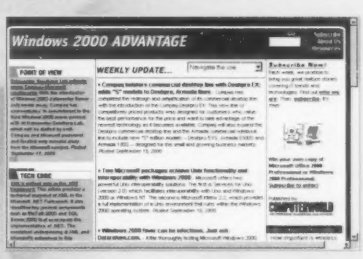
— John Wolfe
systems analyst in
Energy Wholesale Operations
Entergy Corp.

What is Windows 2000 Advantage?

The mission of Windows 2000 Advantage is to become your primary source of timely, useful information for planning and implementing Microsoft Windows 2000 on Compaq solutions and services.

Windows 2000 Advantage is a Web-only magazine because that lets us bring you, the IT leader, great stories that apply to your day-to-day work. We'll keep you up to date with a weekly e-mail alert so you don't miss a thing.

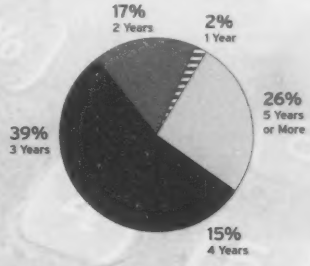
Windows 2000 Advantage is underwritten by Microsoft and Compaq. Its charter is to address the issues that most concern IT managers charged with keeping their companies on top of the latest and best solutions Microsoft and Compaq have to offer. Toward that goal, we offer a wide range of stories including case studies, columns and news to provide you with information you can't find anywhere else.



www.Windows2000Advantage.com/300

QUICKPOLL >

How long of a lifecycle should a client-based operating system have?



Cast your vote now at:
www.Windows2000Advantage.com/300

Base: 297 Respondents

Microsoft COMPAQ

Produced by: COMPUTERWORLD
ENTERPRISE BUSINESS SOLUTIONS

Should You Strike Back?

Continued from page 74

up a fake session when it detects someone trying to install Back Orifice (a remote monitoring program) and logs the IP address of the attacker and any operations he tries to perform.

In addition to vendors, IT managers are also trying to build more reactive capabilities, according to Lestina. She says that more than two-thirds of Predictive's customers are looking for ways to get the upper hand with cyberattackers, and that includes trapping and tracing their activities.

"Say my site is brought under attack from your university, and I have an automated system that returns a message to the attacker saying, 'I detect this; I don't like it; I know where you live; and if you attack us again, you'll get a note from our lawyers,' " says Marcus Ranum, NFR's chief technology officer.

"We call it covert security. When these attacks are spoofed and hidden through the Internet, you need to root them out at the network layer," says Frank Huerta, founder and president of Palo Alto, Calif.-based Recourse Technologies. "It's about finding where the attack is coming from and damming it up at the source."

Slippery Slope

But trapping and tracking also pose some interesting legal questions concerning issues such as trespassing, entrapment and invasion of privacy.

Following an IP address across the Internet means passing through every server the attacker originally compromised. Since each of these servers is privately owned, you need permission, or else you're trespassing.

"There's nothing wrong with doing a Traceroute [a tracking program] back to the IP address, so long as you alert the administrator," explains Ira Winkler, president of security consulting firm Internet Security Advisors Group in Severna Park, Md.

In his book *Tangled Web*, Power asserts that as far back as 1994, when the U.S. Air Force Research Laboratory in Rome, N.Y., was under attack, agents grappled with just how far to track the attacker through a maze of private servers.

"To chase a hacker, you're going to digitally break and enter and trespass to follow the trail," Power says. "Remember that incident in which a burglar fell through a sunroof, sued and won [the lawsuit over the incident]? If a burglar can sue the people he's burgling, a hacker can turn around and sue a Fortune 50 company for invading his privacy, violating his space, causing him fear, whatever."

Antihacking tool vendors have at least considered trespassing when designing their tools. But the effectiveness of those tools is still open to question.

In order to get the bad guys, the traces must occur during a live connection. How, then, does a product like Recourse Technologies' ManHunt track attackers in real time while stopping at each server to ask permission?

Huerta waffles on ManHunt's technical workings, citing "intellectual-property concerns." But he does say that if a company using ManHunt fell under attack, one of two things would happen: ManHunt could pass a digitally signed e-mail message upstream to the predesignated point of contact at the service provider, which would require the recipient to read the mail and decide what action to take, sapping the tool of some of its value. Or, if the upstream Internet service provider were primarily running ManHunt nodes, it could conceivably route the trace automatically and in real time. But Recourse has a lot of selling to do to make that happen.

It's that kind of cooperation that will result in "cutting attacks off at the source" to provide a significant limiting of hack attacks, as ManHunt literature claims. But perpetrators will be cut off the Net only at the behest of the Internet service provider that actually serves the perpetrator, which is also the final destination of the IP tracking software.

Van de Gohm heaves a sigh of exasperation at antihacking tool vendors' cloak-and-dagger claims and the foggy goals behind them. Any basic network can do what these tools claim, he contends. Firewalls log all incoming IP addresses, which can be used to start a trace. And network monitors can track an attacker's activities in the network, unless he erases the system logs, of course.

"In the government, there are a number of reasons to detect, catch, trap and prosecute cyberattackers," van de Gohm says. "But in the private sector, you've got to ask yourself the bottom-line question: Does this enhance shareholder value?"

Huerta says the products do offer value beyond the ability to trap and prosecute. For example, he says, they can tell an administrator in New York what's going on in the company's Sydney, Australia, data center as well. ◗

> It's about finding where the attack is coming from and damming it up at the source.
>
> FRANK HUERTA, PRESIDENT, RECOURSE TECHNOLOGIES INC.

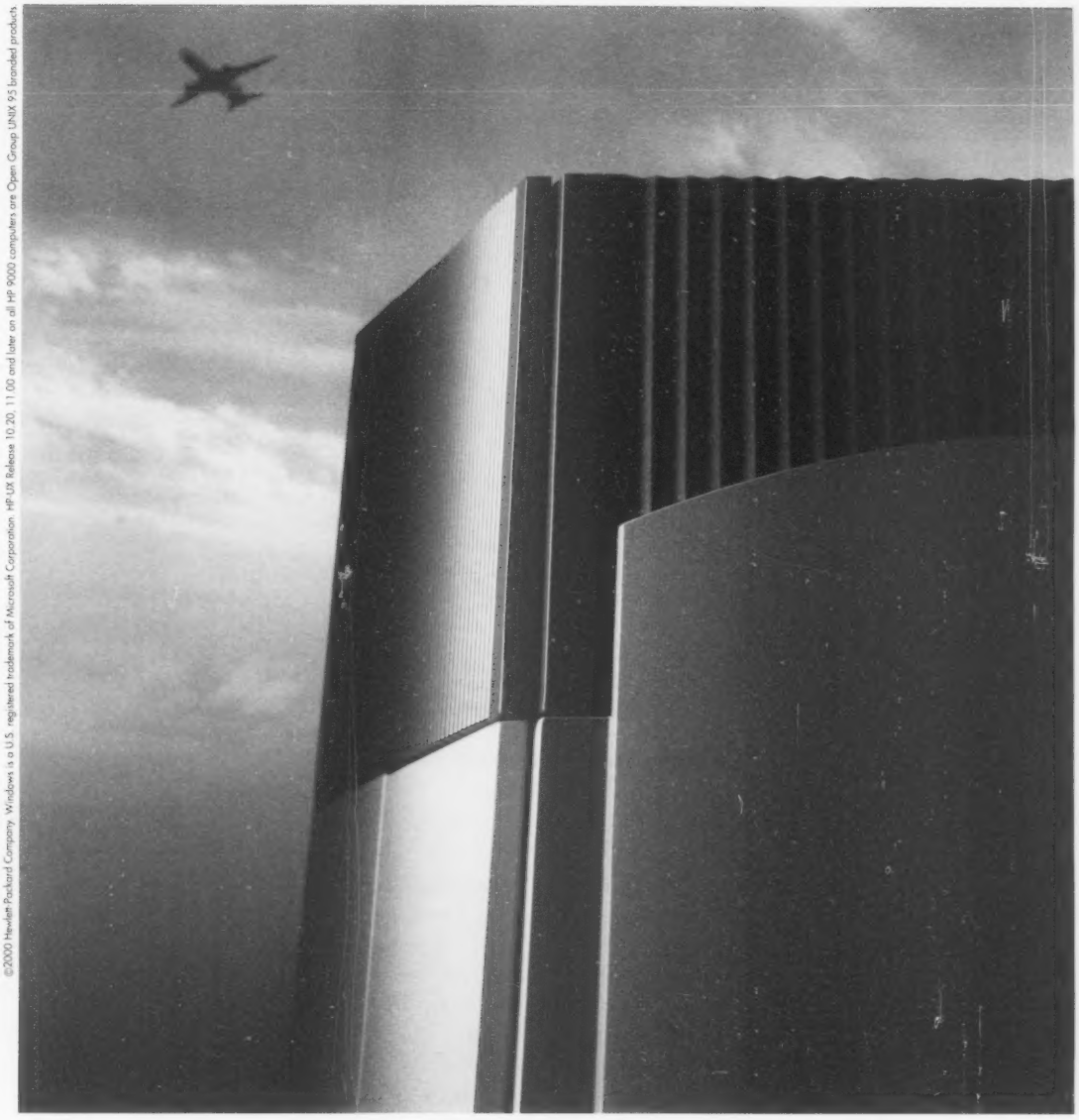
Know Your Culprit

Criminal suits are tough to prosecute, so your evidence must be legally bulletproof, both factually and procedurally, says Ira Winkler, president of Internet Security Advisors Group, who has assisted law enforcement during computer crime investigations.

It's much better to gather your own evidence for a civil suit, he adds, because then it's much easier to prosecute. Whether using commercial tools or other techniques to trap and track an attacker, the important thing is to provide evidence that couldn't have been tampered with. Winkler suggests the following:

1. **When you detect an attack, dump all logs to read-only tape so you can prove that the data hasn't been tampered with.**
2. **Use a line analyzer that records the attacker's session keystrokes in a read-only format to provide evidence of what the attacker was trying to do inside your network.**
3. **Don't threaten the attacker; instead, alert the police. You don't want to escalate a hacking war.**
4. **Don't hack back. "If you do anything that can be perceived as intrusion or denial-of-service and you contact the police, you've just made it really easy for the police to arrest you," says Winkler.**

If you do report the crime to the police, be prepared to show law enforcement that the cost of the crime meets the investigative threshold, which varies, depending on the law enforcement agency involved, says Richard Power, an editor at the Computer Security Institute. "It's got to look like you lost some money," he says. – ***Deborah Radcliff***



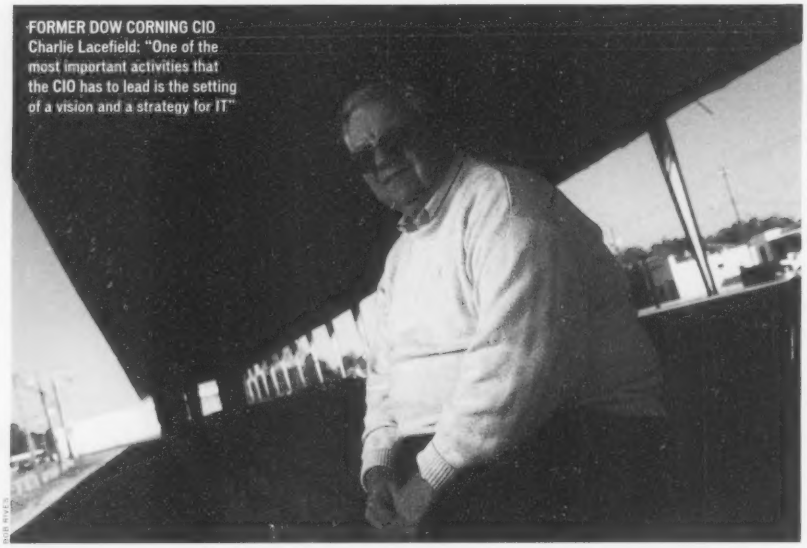
©2000 Hewlett-Packard Company. Windows is a U.S. registered trademark of Microsoft Corporation. HP-UX Release 10.20, 11.00 and later on all HP 9000 computers are Open Group UNIX 95 branded products.

Most servers replace yesterday's servers. This one replaces tomorrow's.

Introducing hp 9000 superdome, the first enterprise server with the flexibility to match its power. Flexibility that's ready for IA-64, and flexibility to run multiple operating systems like HP-UX, Linux, Windows 2000, and others yet to be. Capacity is flexible too. Scale it up or scale it back, paying less when you use less. With hp 9000 superdome, your options are open. Because tomorrow's another day. hp.com/superdome

hp

invent



FORMER DOW CORNING CIO Charlie Lacefield: "One of the most important activities that the CIO has to lead is the setting of a vision and a strategy for IT"

20/20 Hindsight

If you could do it all over again, would you?

It's a question everyone has asked himself at one time or another, and it often lies somewhere between being a frustrating, futile exercise and a valuable learning experience. But still, it's hard not to go there.

Charlie Lacefield, who retired last year as Midland, Mich.-based Dow Corning Corp.'s CIO, spent some time with Computerworld's **Melissa Solomon**, *hashing over his own "what-if" scenarios. In hindsight, he says, there are areas he could have improved at Dow by taking another approach, just as there were those projects for which he chose the right path and learned a great deal in the process.*

Looking back on your career, what would you say are the most critical responsibilities for a CIO? I would define the job as part overall technology responsibility, part process responsibility, and the third piece, which should not be underestimated, is the people responsibility. I think a lot of CIOs come into the position with really strong IT technology capabilities, and they're maybe not quite as strong on the process side and possibly weak on the people side. And that's where I think people fail, because they don't recognize what I call the unique needs for people in IT.

Such as? IT tends to be a group of people who are isolated. It's easier for them to interface with a computer screen sometimes than it is for them to interface with people. It's very important to get your IT people to relate to the business world and be part of the business world.

Did you ever struggle with an employee who just couldn't grasp that? The answer to that is yes. I would put these people into a position where they could work alone, and we would just draw on their skill base but not expect them to be part of the decision-making group.

WHO IS HE?

Charlie Lacefield, 60, retired last year from Dow Corning after 36 years in various leadership positions. He now lives in North Carolina and, despite his so-called retirement, serves as president of Phios Corp., a Cambridge, Mass.-based process repository services firm that was spun off from MIT.

What should a CIO's top management priorities be? I think one of the most important activities that the CIO has to lead is the setting of a vision and a strategy for IT. That can't be left to consultants or to the organization. The leadership must come from the CIO. Then I think it's important to take that vision and strategy and reduce it to a deliverables map.

I found that you've got two things you can deliver on a broad basis in IT: You can deliver to a time line or you can deliver to the full scope of a project, and if I had to err on one, I'd err on delivering to the time line, even if I had to reduce the scope. You've just got to say, "Move on." It's one way to keep the cost structure under control.

Any projects you wished you had stepped back from sooner? I think at the end of it all — I was reflecting on this the other day — it seems like there's trade-offs or balances between centralization and decentralization of the IT capability. And I believe that in Dow Corning, when I first got into the organization . . . we were too heavy on the decentralization and not heavy enough on the centralization. As an example, we had had computing centers in the U.S., Europe and Asia. We wound up with the computing center, the hardware piece, only in the U.S.

Why was that? It was economical to do it. Running one set of computers is a lot cheaper than running three [sets of] computers. It was kind of stepwise, so every time that we took a step, we could see the next step was clearer. And Dow Corning was a shop when I took over that was "build your own" in terms of systems, and we made a major decision to purchase rather than to build. I started with the SAP implementation, and once you have that framework of a common system, it becomes clear where centralization can help.

Are there skills you wished you had further developed in your career? In order to have felt better prepared for the CIO job, if I had had more in-depth IT skills, I certainly would have felt that way. But I realized going in that I didn't have the depth of IT skills, so I was sure to build a staff of people around me that covered for that weakness.

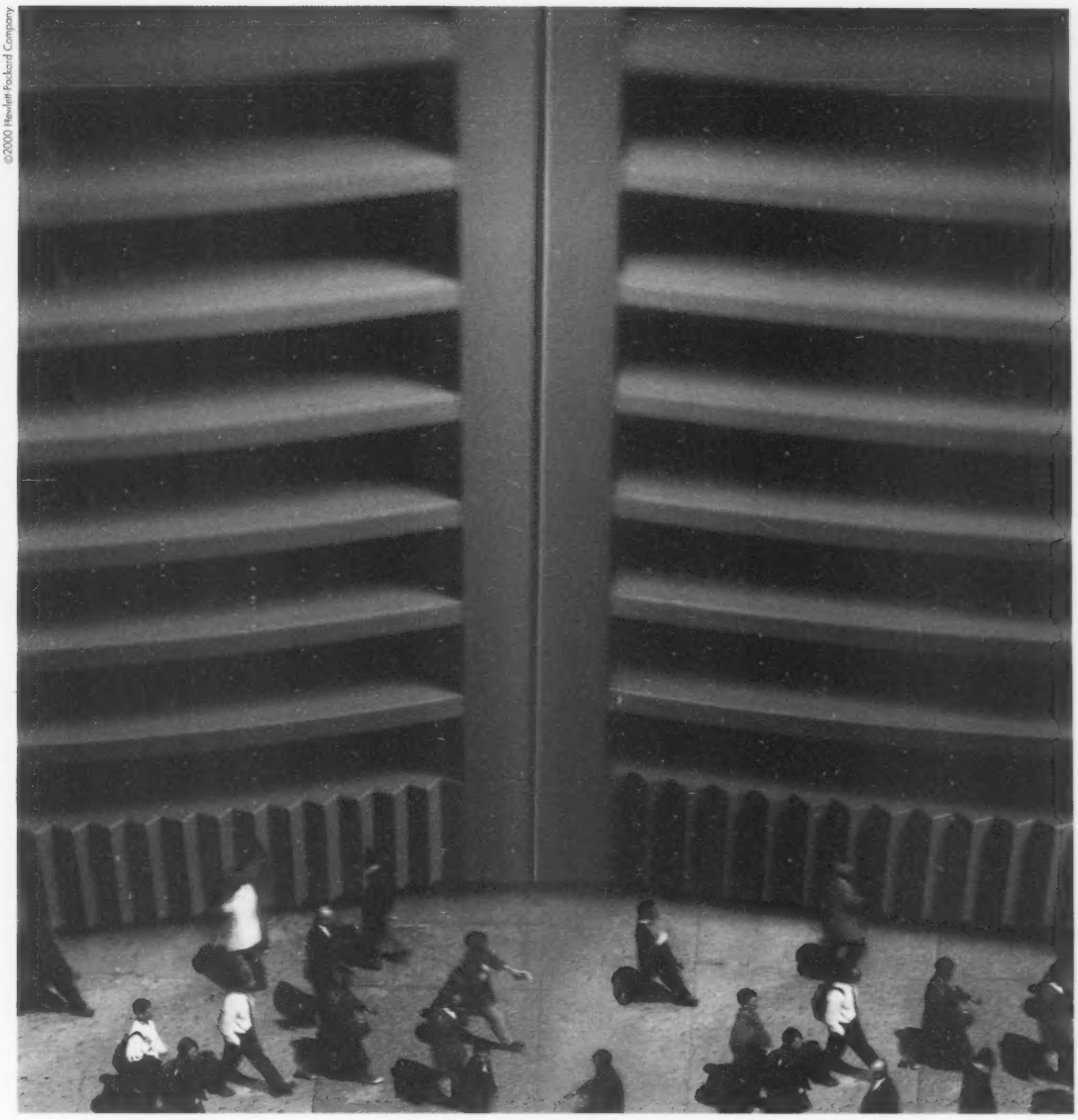
You've got to have enough understanding of what the question is so that you're not going to get fooled by what people are asking.

How would you have gone about learning such skills quickly? Actually, the way I wound up doing it seemed to me to be effective in hindsight. I spent a lot of time with what I would call outside, external organizations. We became part of the Center for Information Research, which gave me some insight. We were members of the Information Management Forum, which is another fine organization; it has a lot of companies that belong to it that share in a practical sense what they're doing. And I just found that being part of some of these external organizations was a much more effective way of learning it than trying to learn it internally.

You talked about how important it is to set the right tone. What was the tone you were going for? The tone was [to] start with customer satisfaction. And the tone was adding value to the business — and, in fact, for IT people to be very comfortable with IT projects being led by businesspeople. [Otherwise] you wind up working on bells and whistles that ought to be challenged, frankly.

Anything you would have done differently in setting that tone? If I were starting over today on something like that, I would have rushed to prepare a vision and strategy that was embraced by the IT people and the business community. [I spent too long] — the better part of a year — working on that. Because it does set the framework for change — change inside your own organization and change as to how the IT organization is accepted in the corporation. ◗

©2000 Hewlett-Packard Company



A box without service is a box.

With hp people, hp 9000 superdome becomes a solution, instead of a server.

Service is comprehensive and included. We handle site planning, integration services, customized training, and monitoring.

It's service made simple. So simple, in fact, that we can adjust your capacity over the phone.

Without, ironically, a service call. hp.com/superdome

hp

invent

Selling teens

Prompted by the IT worker's poor public image and the growing shortage of skilled IT professionals, a new media campaign hopes to convince kids that this is one exciting career field they should get in on. By Erica Manfred

WITH ALL THE ATTRACTION TO technology games, gadgets and instant messaging, you'd think teens would finally view information technology jobs as pretty cool, right? Think again. The profession appears to have made little headway in remaking its image with kids, who still see technology professionals as anything but cool. This isn't good news for workforce experts who hope to see more technology workers entering the labor pool in the coming years.

The problem? Image — despite the popularity of the Internet with young people. When asked to draw their image of a typical technology worker, a focus group of middle school students recently portrayed a nerdy guy with thick glasses, spiky hair, high-rise pants and a pocket protector. The guy was sleeping under a desk, because the students said they thought technology workers work 24 hours a day.

"Kids want to play with technology but don't want to be technical workers," asserts Phyllis Eisen, executive director of the Center for Workforce Success at the Washington-based National Association of Manufacturers (NAM). "They want to use computers rather than program them."

In response to statistics that by 2008, the U.S. will require more than 2 million new, highly skilled IT workers, the U.S. Department of Commerce's Office of Technology Policy, together with the NAM and a number of corporations, is launching GetTech, a campaign to inspire teens to prepare for the technology-driven jobs of tomorrow.

The campaign includes print and TV ads, an information packet available through a toll-free phone number and a Web site, Gettech.org. The goal is to encourage U.S. students to develop the fundamental math, science and technology skills that will enable them to take advantage of the high wage opportunities in the New Economy.

The premise of GetTech is that you have to catch kids early — and you also have to influence parents to encourage their children to pursue IT careers.

Kamran Khan, vice president of IT at Marist College in Poughkeepsie, N.Y., says he agrees with the need for such a campaign. "We need to market information technology more in our schools and provide students with a positive spin on a high-tech career," he says. "A good way to do this is to have mentors and advisers for the younger generation."

A centerpiece of the campaign is a series of public-service announcements for TV and radio produced by the nonprofit firm Women in Film in Hollywood.

on IT

The spots aim to overcome the fear factor, which Women in Film Vice President Judith Parker Harris says is a major roadblock for teens considering high-tech careers. "We want to get kids past their fear of technology by emphasizing that you'll miss out on really cool stuff if you don't 'get tech,' " says Harris.

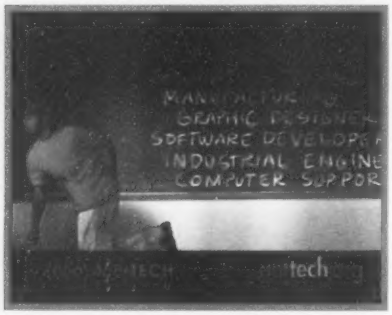
GetTech will be reaching out to minorities and teen-age girls, who are statistically least likely to take advanced math and science classes. "Even though it was recently reported that girls' use of the Internet has increased 126%, the number of girls saying they wanted to go into engineering has actually decreased, to under 10%," Eisen says.

The TV spot aimed at kids shows a group of rappers, all nonwhite or female, singing a catchy tune about how you could be a millionaire at age 30 if you "get tech" (see article, page 84). A spot aimed at parents shows a bright golden globe floating down from the dot in Gettech.org in the sky. The ball lands in a parent's hand, and she passes it on to her child.

"Parents are also intimidated by technology," Harris explains. "We're trying to reassure parents that they can do it. They can work with their kids in math and science." ◗

Manfred is a freelance writer in Catskill, N.Y.

ALAN LEVENSON



GETTECH.ORG

Get Tech to Get Rich?

THE GETTECH VIDEOS produced by Women in Film aim to attract kids to high-tech careers by describing the potential benefits of employment in the field. The shots above show teens delivering that message via a catchy rap song.

GetTech Drive Draws Mixed Reviews

What do hiring managers, educators and other information technology labor experts think about the GetTech campaign and its role in addressing the IT skills shortage? Computerworld *asked Ira S. Wolfe, president of Success Performance Solutions in Leola, Pa..; IT recruiter Ernest Ball at The Epitec Group in Southfield, Mich.; Kamran Khan, vice president of IT at Marist College in Poughkeepsie, N.Y.; and Joanne Kelleher, human resources director at Pinnacle Decision Systems Inc. in Middletown, Conn.*

What are the qualities, attitudes and skills of entry-level IT hires just out of college today?

Wolfe: The one most significant change is that young people look at first jobs as opportunities to "try the career on" before taking it home. College is only one step in the ladder of career achievement. A significant problem is gender. Less than 10% of computer science majors in college are women, although they make up over 50% of the workforce.

Khan: Entry-level applicants are very motivated, dedicated and understand the new emerging technologies. They are eager to work on challenging projects that have a state-of-the-art flavor.

Ball: Entry-level candidates in today's market are better-informed and educated than their counterparts were 10 years ago. Today's applicant has done far more research on trends, emerging technology and prospective employers.

Kelleher: Most recent grads just don't get what the business world is all about. One résumé that came in this week talked about all the great things the person did in school, including his extracurricular activities, but it had nothing about the business skills he'd learned in class. His problem was typical. Colleges need to put more emphasis on the business applications of technology.

Are you aware of the GetTech campaign? If so, what do you think of it?

Kelleher: Overall, the idea of the campaign is a good one, and I like the design and the content of the Web site. My concern is how they are planning to promote it. It doesn't matter how good the message is, if it doesn't get to the right audience, nothing will happen. Also, they should pay more attention to giving teens immediate answers on the Web site.

Ball: Programs like GetTech are critical to the continued success and development of tomorrow's leaders in technology. From such efforts, we will see the next generation of leaders like Bill Gates and Larry Ellison.

Khan: I am a proponent of such a campaign, provided that students also pay attention to reading, writing and sciences that are essential to a well-rounded education so they can become good communicators. We need to market information technology more in our schools and provide students with a positive spin on high-tech careers. One way to do this is to provide mentors and advisers for our younger generation.

Do you think IT careers have a negative image? Do you think the computer nerd stereotype turns off youngsters?

Kelleher: The nerd stereotype is still there, but it isn't as strong as it used to be now that technology has changed from mainframes and punch cards to the New Economy and the Internet. Kids are now exposed to technology at a much younger age.

Even my 4-year-old can use a mouse. This upcoming generation, which grew up with home computers, won't have the same view as past generations because, in a way, they're all computer nerds.

Ball: The stereotype still exists. Youngsters who would have considered a career in IT but chose law or medicine did so because those professions presented them with images that felt cooler. The Internet has started to bridge that chasm.

Today, there are more 25-year-old business owners with cool work environments who are acting as mentors and role models for today's youth. Things are changing, but there's plenty of work to be done

Khan: I do not think that IT careers have a negative image, especially during the past five years, when technology has helped so many of us.

In many cases, "nerd" is being used today as a positive description of someone's accomplishments in development of IT systems.

Wolf: IT to many people does mean nerdy and techy. However, 90% of all IT jobs are at non-IT companies. It's not all programming and systems analysts. Web developers and sales are also IT careers.

There is a huge debate on whether the U.S. labor force lacks the skills that employers want to hire, or the bodies to work in IT in the first place. What do you think is the underlying cause of the labor shortage in IT, and what do you think should be done about it?

Khan: Our colleges and universities aren't graduating enough computer science/information systems majors and Ph.D.s. Due to high salaries in IT, the number of teachers and professors has declined as they opt for more lucrative positions in the private sector. We need to provide incentives for both teachers and students to increase the numbers of graduates in IT.

Also, the government needs to provide more training, scholarships and grants to students who want to pursue IT careers. We cannot and should not depend on foreign labor. We have to invest in our own citizens.

Wolfe: Technology is competing with every other industry. Health care worker and teacher shortages will exceed those of technology. The solution is a strategic one and will require every industry to look at ways to be more productive with fewer people and to avoid recruitment, hiring and retention mistakes.

Ball: There is no one reason for the labor shortage in IT careers. Certainly, subjects like math and science, which are critical to technology, need to be stressed at a younger age. As a culture, we have moved away from the sciences and arts and we need to refocus some of that energy.

You'd be surprised at the number of musicians and artists who are also involved in IT. We need to promote ourselves better. After all, how many other careers can you think of where a youngster can run his own successful international business and compete globally while riding a Razor Wheel through the office – all before being able to vote? Let's see those corporate attorneys compete with that.

Bring it on!

– Erica Manfred

Frankenstein,

Count Dracula,

The Creature from the Black Lagoon

Would you do business with any of these monsters?

HireAbility.com provides a not so frightening, customized alternative to the overwhelming, hard to manage recruitment sites on the Internet today. Whether you're looking for the perfect job or the perfect candidate, HireAbility.com focuses on making the perfect match between IT professionals and the clients that need their skills. Instead of trying to be everything to everybody we focus on what we do best and that's IT!

At HireAbility.com we pride ourselves on our commitment to quality service and customer relations. We're building communities for IT and recruiting professionals, and hiring managers to share information and tap into valuable resources and services. We offer specialized profiles and enhanced searching capabilities, which won't leave you fighting off a variety of unlikely prospects. Also, HireAbility.com's intuitive user-friendly design, contact lists and group e-mailing capabilities greatly improve efficiency.

HireAbility.com the search is over.

Reading, Anyone?

New book titles touch on leadership, management, the Web and the future of IT

Managing Crises Before They Happen: What Every Executive and Manager Needs to Know About Crisis Management, *by Ian I. Mitroff (with Gus Anagnos).* Mitroff, a business policy professor at the University of Southern California, believes complacency lies at the root of how badly companies generally manage crises. His book offers thoughts and principles that can form the core of a successful crisis management program. (Amacom Books, 166 pages, $24.95)

The Leadership Investment: How the World's Best Organizations Gain Strategic Advantage Through Leadership Development, *by Robert M. Fulmer and Marshall Goldsmith.* The authors look at how six organizations, including General Electric Co. and Johnson & Johnson, use leadership development to gain strategic advantage. (Amacom Books, 322 pages, $27.95)

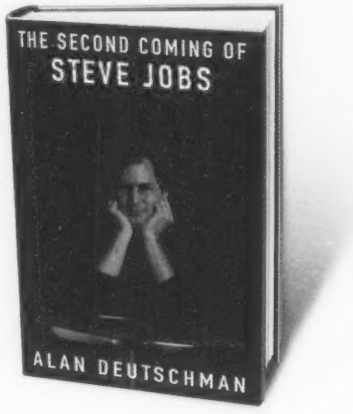
The Unfinished Revolution: Human-Centered Computers and What They Can Do for Us, *by Michael Dertouzos.* Due in January, this book by the director of MIT's Laboratory for Computer Science envisions computing becoming as easy as driving a car. (HarperCollins, 217 pages, $26)

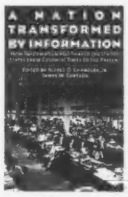
MetaCapitalism: The E-Business Revolution and the Design of 21st-Century Companies and Markets, *by Grady Means and David Schneider.* The authors, partners at PricewaterhouseCoopers, sort out the many changes the Internet is causing in the business world and show how companies are taking advantage of these changes, especially with global expansion. (John Wiley & Sons, 179 pages, $24.95)

The Second Coming of Steve Jobs, *by Alan Deutschman.* This unauthorized biography of Apple Computer Inc.'s founder goes behind what the media sees to reveal a portrait of a complex man. Deutschman talks with nearly 100 people who are close to Jobs. (Broadway Books, 305 pages, $26)

From .com to .profit: Inventing Business Models That Deliver Value and Profit, *by Nick Earle and Peter G.W. Keen.* The authors (Keen is a *Computerworld* columnist) look at business lessons from the Internet explosion of the '90s and lay out "value imperatives" for companies to follow. (Jossey-Bass, 200 pages, $26)

Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web, *by Tim Berners-Lee (with Mark Fischetti).* This book shares the inside story behind the development and philosophy that has governed the growth of the Web from the man who created it. Berners-Lee, director of the World Wide Web Consortium at MIT, also describes his vision for the Web's future. (HarperBusiness, 246 pages, $15)





A Nation Transformed by Information: How Information Has Shaped the United States from Colonial Times to the Present. *Edited by Alfred D Chandler Jr. and James W. Cortada.* With chapters by experts from a variety of disciplines, this book claims that the Information Highway is far from new. Looking at the creation of a postal system, the building of roads, the invention of television and movies, and finally, the Internet, the editors present the theory that the Information Highway has been shaping North American culture for nearly 300 years. (Oxford University Press, 380 pages, $39.95)

The Difficult Hire: Seven Recruitment and Selection Principles for Hard-to-Fill Positions, *by Dennis Doverspike, Ph.D., and Rhonda C. Tuel.* Successful recruiting requires understanding why people take jobs at certain organizations, according to Doverspike and Tuel. In this book, they explore seven principles that are necessary for effective recruiting, screening and hiring. (Impact Publications, 151 pages, $14.95) ▶

CONFERENCES

■ THE 2000 CORPORATE COMMUNICATION AND TECHNOLOGY CONFERENCE
The Waldorf-Astoria Hotel, New York; Nov. 28-29
A look at how information technology, especially the Internet, influences the effectiveness of intraorganizational communications.
COST: $1,395 for Conference Board associates; $1,600 for others
CONTACT: The Conference Board Inc., New York, at (212) 339-0345; fax: (212) 836-9740.
www.conferenceboard.org

■ THE DELPHI B2B SUMMIT
Amelia Island Resort, Amelia Island, Fla.; Nov. 28-Dec. 1
Three days of case study presentations that focus on best practices, markets and alliances in business-to-business e-commerce initiatives.
COST: $2,000
CONTACT: The Delphi Group, Boston, at (800) 575-3367.
www.theb2bsummit.com

■ E-SECURITY CONFERENCE AND EXPO
Hyatt Regency Crystal City, Arlington, Va.; Nov. 30-Dec. 1
For business and IT managers who have a say in their organizations' e-business security.
COST: $895 by Nov. 23; $995 after Nov. 23
CONTACT: Intermedia Group Inc., Westboro, Mass., at (508) 870-5858, Ext. 19; e-mail: message@imgevents.com.
www.imgevents.com/security

■ E-BUSINESS IT OPERATIONS AND MANAGEMENT FORUM
Hyatt Orlando; Dec. 4-5
Focuses on e-business run-and-support strategies as well as options and tools that can help meet e-business IT operational needs.
COST: $895 by Nov. 27; $995 after Nov. 27
CONTACT: Intermedia Group at (508) 870-5858, Ext. 19; e-mail: message@imgevents.com.
www.imgevents.com/ebom

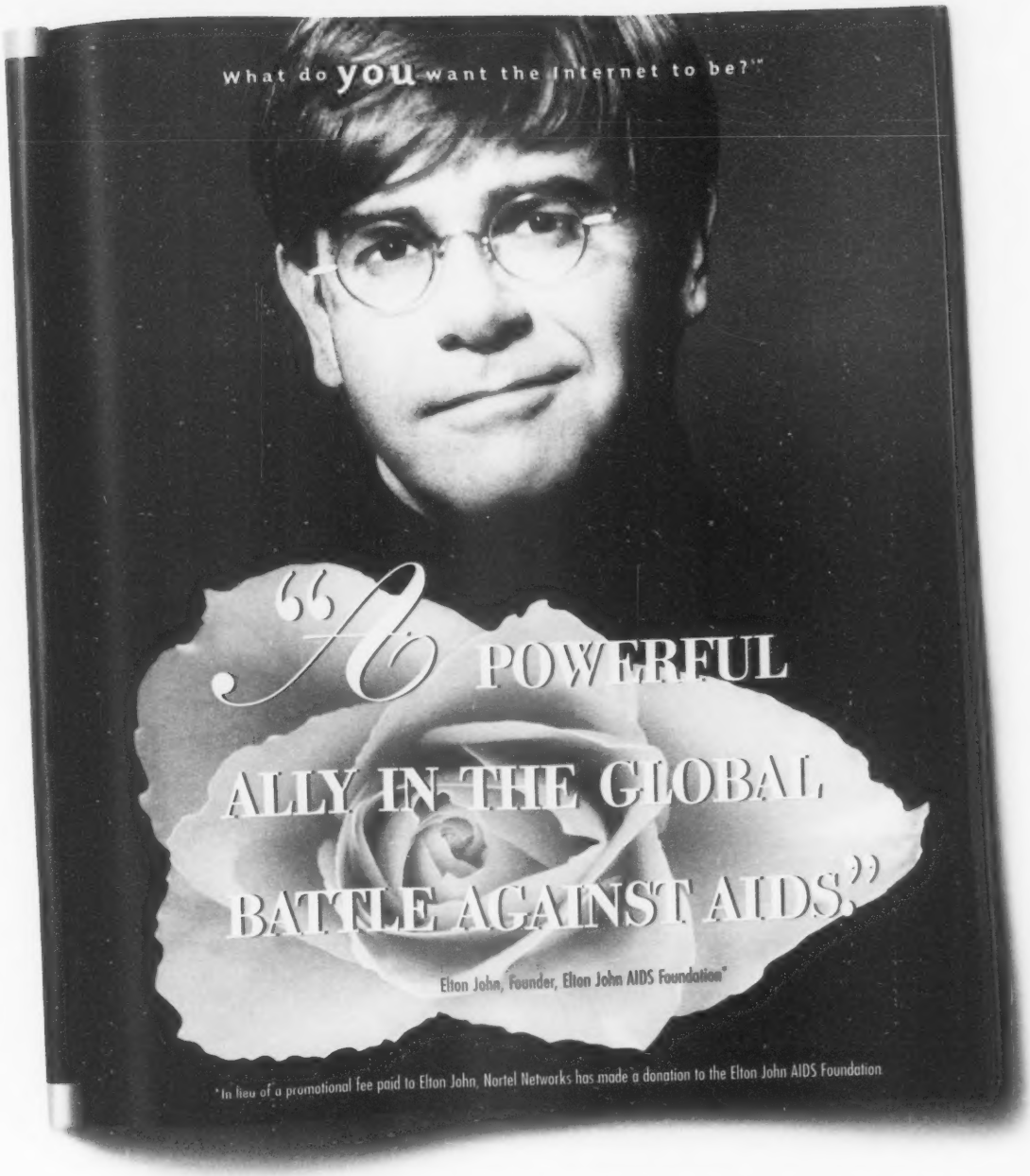
■ EHEALTHCARE WORLD
Javits Center, New York; Dec. 4-6
Discusses what's coming up in the convergence of health care and the Internet.
COST: $1,295 by Dec. 1; $1,395 after Dec. 1.
CONTACT: eMarketWorld Inc., Richmond, Va., at (800) 535-1812, or (804) 643-8375; fax: (800) 942-9770 or (804) 643-7479.
www.ehealthcareworld.com/events

■ ONLINE EXCHANGES 2000 CHICAGO
Sheraton Hotel & Towers, Chicago; Dec. 4-6
A look at the present and future of business-to-business commerce.
COST: $1,795
CONTACT: First Conferences Ltd., London, at (800) 814-3459; fax: (800) 814-3460.
www.marketsandexchanges.com

■ CAPITOL SANS 2000
Grand Hyatt Washington; Dec. 10-15
Offers a look at the technology behind security — from soup to nuts.
COST: $1,859 to $2,999
CONTACT: The SANS Institute, Fredericksburg, Va., at (540) 372-7066; fax: (540) 372-3835.
www.sans.org/capsans2000 register

■ E-CUSTOMER SERVICE & SUPPORT CONFERENCE
Hyatt Regency Hotel, Miami; Dec. 12-14
Covers trends in e-commerce customer service, different solutions used to communicate with customers and the best methods for identifying the skills that are needed for good customer service and support.
COST: $1,095 to $1,295
CONTACT: Digital Consulting Inc., Andover, Mass., at (978) 470-3880; fax: (978) 470-0526; e-mail confreg@dci.com.
www.dci.com

■ E-BUSINESS CONFERENCE AND EXPO
Javits Center, New York; Dec. 12-14
Discusses the strategies, products and implications of e-businesses.
COST: $995 through Nov. 20; $1,295 after Nov. 20
CONTACT: CMP Media Inc., Manhasset, N.Y., at (800) 652-2578, Ext. 8228; fax: (212) 592-8233.
www.ebusinessexpo.com



Optical Internet

Never before has the Internet been more uniquely poised to make a difference. And with Nortel Networks™ OPTera™ optical solutions, the ability to use the new, high-performance Internet to raise awareness, educate, and share experiences and scientific data is unprecedented. You see, our optical solutions bring speed, reliability, scalability and economy to everything from data and call centers to campus or metro networks. That means you can collaborate and exchange information in record time – a valuable commodity in the race to save lives. So come together, right now with Nortel Networks. And make the Internet whatever you want it to be. **nortelnetworks.com**

NORTEL NETWORKS™

How the world shares ideas.

Nortel Networks, OPTera, the Nortel Networks logo, the Globemark and "How the world shares ideas." are trademarks of Nortel Networks. "What do you want the Internet to be?" is a service mark of Nortel Networks. ©2000 Nortel Networks. All rights reserved.

Market Valuations

BY MARIA TROMBLY

DEFINITION

Market valuation: An estimated measure by investors and analysts of a company's worth. Valuations can be based on assets, revenue, earnings, cash flow or other factors.

THERE'S A technical term in economics — known as the "greater fool theory" — which applies to situations like pyramid schemes and stock-market bubbles.

The idea is that while a stock or a moneymaking scheme may be fundamentally worthless, it may still make sense to invest in it if a greater fool will come along and take it off your hands at a higher price.

Unfortunately for flimflam men and "momentum investors" — people who invest when it looks as though a stock is going up — the supply of fools eventually runs out and prices tumble to their true levels.

One of the key questions investors are asking themselves today is this: Have stock prices for dot-coms reached their true levels?

J.P. MORGAN'S WYMAN: Amazon's growth expected to slow

This is where market valuations come in — the measures of what a company is worth. One easy way to judge the worth of a company is to multiply the price of each share by the total number of outstanding shares. This is what is known as the market capitalization of a company. If the market were perfect, market capitalization would be the true value of a company.

Other Ways to Value

Another way of valuing a company is to count up its assets, including its physical facilities and patents.

A company can also be valued by examining its books, by looking at how many customers it has, how much money it makes and how fast it is expected to grow in the future.

When the stock market was soaring and the New Economy was blossoming about two years ago, some Wall Street analysts argued that dot-coms needed to be valued based on their growth potential, not on their profitability. As a result, many high-tech companies, such as Seattle-based Amazon.com Inc., were valued based on projected revenue or on how quickly they were adding Web site visitors. "Amazon's revenues grew 170% from 1998 to 1999. This year, we're forecasting that they'll grow 60% year-over-year, says Tom Wyman, an analyst at J.P. Morgan & Co. in New York. "You can see that they're slowing down."

That slowdown in revenue growth — and the resulting drop in valuations that were based on projected revenue — helps explain why Amazon's stock price has plummeted from more than $126 in October 1998, hitting a new 52-week low of $19 on Oct. 18.

An Industry Matures

Every company's revenue growth will slow once it reaches a certain size, says Wyman, but it doesn't necessarily mean that the first set of valuations was wrong. "If the company does grow 60%, it will be the fastest growth rate for a retailer this size in the country," he says. With annual revenue of more than $1 billion and sales that are growing 60% annually, says Wyman, Amazon's numbers are "nothing to sneeze at."

But investors today are more concerned with the profitability and sustainability of New Economy companies, said David Zale, an analyst at Sands Brothers & Co. in New York. "The only true measurement of a company's stock price is the ability of a company to generate cash," he says.

To figure that out, says Zale, investors can look at historic earnings or future earnings, or examine cash-flow reports to get hints at how healthy a company is.

What makes it more difficult to determine the value of an Internet company such as Yahoo Inc. in Santa Clara, Calif., than a traditional brick-and-mortar firm like Hoffman Estates, Ill.-based Sears, Roebuck and Co. is that there isn't a lot of history to draw upon. New Economy companies lack financial track records, and the sector as a whole is uncharted territory.

"We're just not there yet in terms of knowing who wins and who loses and what kind of cash flows are associated with being a winner," says Wyman. "It makes it difficult to pin down whether [a company] should be worth 20 times revenues, 50 times revenues or two times revenues."

Meanwhile, Internet companies and their investors have begun to mature, says Zale.

Substance or Mere Hype?

"You have a change in the shareholders," Zale says. "You have had shareholders who were in at the beginning who were purely momentum shareholders. Once there's any hiccup, they're out. The next group of people comes in [and they] really understand what this business is about" and concern themselves more with earnings potential and cash flow, he says.

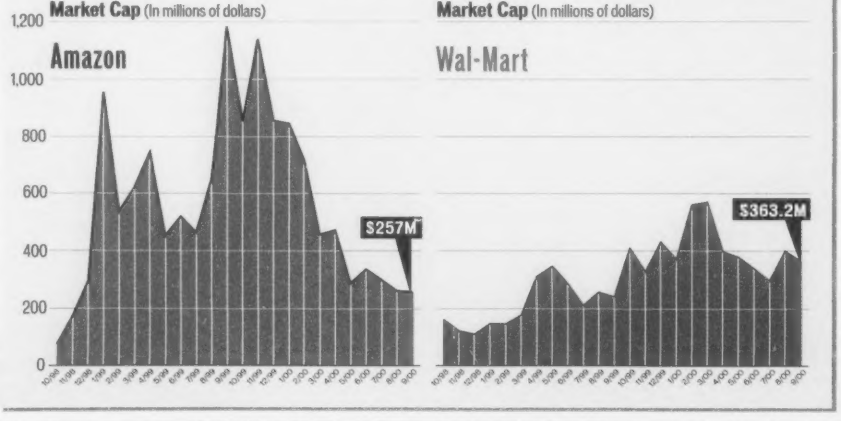
Once educated investors have taken a close look at dot-coms, they may find there's not much substance beyond the hype, according to Jim Horty, president of Horty & Horty PA, an accounting firm in Wilmington, Del., that specializes in valuing start-ups. That's because it's typically easier for a traditional firm to launch an e-business than it is for an Internet firm to acquire a deep understanding of a particular industry, he says.

Many dot-coms that started with flimsy business models are now facing competition from traditional businesses — and they often don't measure up.

"The people who understand the business and the merchandise now know enough about the dot-com world to have their own outlets," Horty says. "And they understand that merchandising business much better than the dot-coms do."

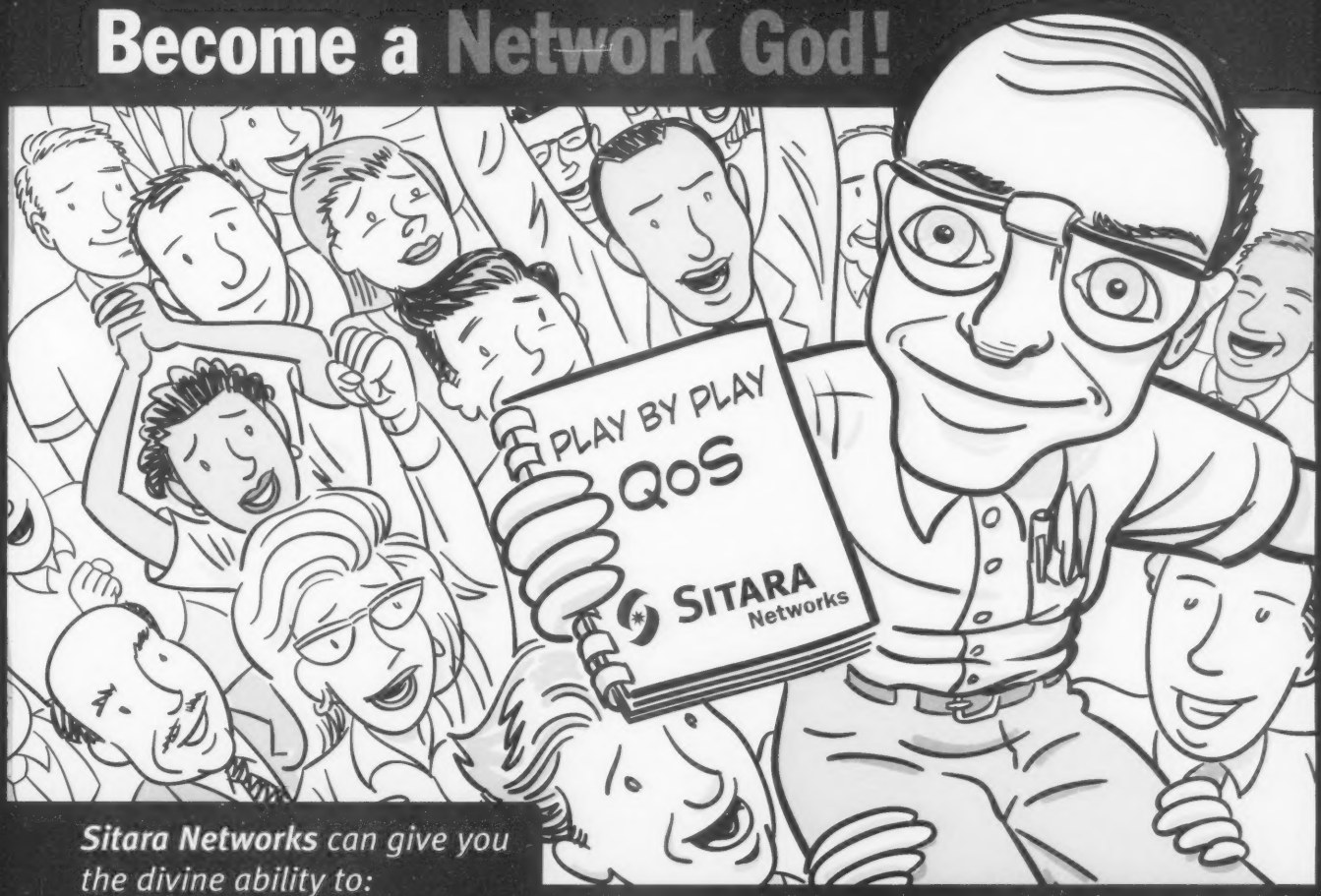
The Rise and Fall of Dot-Coms

By comparison, traditional companies have seen fewer ups and downs over the past two years



■ *Are there business terms you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

Become a Network God!



***Sitara Networks** can give you the divine ability to:*

- Deliver bandwidth on-demand
- Deliver consistent response time
- Ensure SLA guarantees
- Rapidly deploy e-business applications

...all within your network budget and resources.

Sitara's QoSDirector™ won:

PEOPLE'S CHOICE
BEST OF SHOW
INTEROP

2000 ComNews EDITORS' CHOICE

Gain the power to make your network a virtual paradise.

Every company, from small enterprises to large service providers can achieve this higher state of enlightenment and functionality. If not, your business is at risk, and your competition knows it.

Sitara's layer of intelligence customizes the network to deliver what you need when you need it. Deliver quality VoIP, consistent application response time, fast web access, and guaranteed SLAs all on your existing network.

We're the 1st company to deliver an integrated and modular QoS (Quality of Service) platform worldwide that integrates highly scalable bandwidth management, a layer of application specific intelligence, and end-to-end comprehensive QoS management.

By partnering with industry leaders, including Siemens, Citrix® Systems Inc. and Sumitomo Corporation – Sitara protects your network with holistic QoS.

SITARA Networks®

Making Networks Smarter

www.sitaranetworks.com

© 2000 Sitara Networks, Inc. Sitara and the Sitara Logo are registered trademarks, and QoSDirector is a trademark of Sitara Networks, Inc. All other trademarks are property of their respective holders. All rights reserved.

JOE AUER/DRIVING THE DEAL

Work out details later? No! Now!

HERE'S A CLASSIC EXAMPLE of why you should always make sure service levels are specified before you sign a contract with a vendor. During recent negotiations for a large data center outsourcing agreement, the vendor skillfully avoided tougher service-level guarantees by convincing the customer that service-level agreements (SLA) should be negotiated after a 90-day transition period. The vendor convincingly argued that service levels could be better determined once it understood the customer's operations.

The vendor suggested that the two sides work together to identify service levels during the transition. The customer fell for this, believing that information gathered during the transition period would produce more favorable SLAs. The customer signed a contract with no specific SLAs, no "out" clause if the two parties failed to agree on service levels and no recourse if the vendor failed to perform.

At the end of the transition period, the vendor was willing to sign only a few weak SLAs with no remedies. For example, the supplier agreed to make applications "generally available" and that help desk calls would be answered "as soon as practical." As you might suspect, the vendor escaped accountability with these "commitments" because no one could agree on what those terms really meant. As a result, the customer ended up with a multiyear contract that heavily favored the vendor.

To avoid this kind of mess, start with specific SLAs and remedies in your request for proposals. Let a qualified vendor perform due diligence under a nondisclosure clause as part of its preparation before making its proposal.

A vendor's bid should be based on your required SLAs, which should at least match the service IT is currently providing. In most cases, the SLA should exceed the current levels because you're considering services provided by "experts." The key is to specify desired service levels up front, early in the vendor evaluation process.

The critical error here was signing a long-term contract without agreement on a fundamental issue — service quality. With a signed contract and no SLAs, a vendor won't be motivated to guarantee exemplary service, only a minimal quality commitment that would leave the customer without meaningful recourse for unsatisfactory service.

Mail Bag

In response to my Sept. 4 column about responsibility for negotiations, I received an insightful e-mail from Rick Zuza, an assistant vice president for procurement at Allstate Insurance Co. It's right on:

"The solution is simple, although the execution is much more difficult. Have a well-trained procurement professional do the deal! This ensures consistency across all IT deals. This also saves the motivation problem, for this is their primary metric.

Finally, IT people need to work with the vendors every day on technical issues. This is less than optimal when conflict occurs. Once again, the procurement professional can be the 'bad guy,' getting tough during contract administration. Also, this frees up the IT professional to do, well, IT.

Now, the tough part, the execution. Are CIOs willing to relinquish this control to the procurement department? Is the CEO willing to invest in hiring and training top talent for the procurement department in order to accomplish this objective? Even after the control is transferred to the procurement department, will the CIO and his lieutenants resist undercutting the power of the procurement [department] by doing deals on the side?

"These are tough questions. But if you look around at the companies cutting the best deals and having their vendors live up to them, they have the one-two punch of the IT and procurement departments working together — IT defining the technology and the SLAs, procurement going out and selecting the vendors and enforcing the SLAs."

Thanks, Rick. My only addition is that a cross-functional team, covering procurement, IT, legal, finance, operations, the end user and senior management, is the way to go on large deals.

JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High Tech Acquisition Professionals. Contact him at joe@dobetterdeals.com.

BRIEFS

Domain Dispute

A company that wants to preregister new top-level domains is suing the Internet Corporation for Assigned Names and Numbers (ICANN), the organization charged with managing the domain-name system. San Antonio-based RegLand Inc. is accusing ICANN of interfering with RegLand's business of letting people "stand in line" for the as-yet-unannounced domains. Marina del Rey, Calif.-based ICANN is soon expected to expand the number of new top-level domains beyond .com, .net and .org.

RegLand, for a $20 fee, promises to stay on top of the registration process and to move swiftly when the top-level domains are created, but isn't guaranteeing customers that it will succeed with the registration.

ICANN, according to RegLand's lawsuit, is disrupting the partnerships it is seeking with registrars needed to deliver its service. In a statement, ICANN called the lawsuit "utterly baseless."

Electronic-Book Publishing

Time Warner Trade Publishing, the parent company of Little, Brown and Co., Warner Books Inc., Little, Brown Children's Books, Bulfinch Press and Time Warner AudioBooks, last week tapped Rockville, Md.-based Artesia Technologies Inc. to help streamline the company's internal workflow system. Time Warner Trade Publishing will use Artesia's Teams digital asset-management software to create an enterprisewide, Web-based digital archive to store and reuse print and audio books, as well as manage manuscripts, artworks, author biographies and editorial reviews.

Digital Video

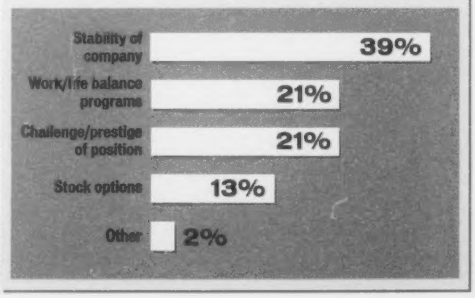
Sprint PCS Group in Kansas City, Mo., and FlashPoint Technology Inc. in San Jose announced a partnership last week that will allow enterprise customers to send images to the Internet via Sprint's wireless networks. The system will use a digital camera connected to a Sprint PCS Internet-ready phone, with digital imaging provided by Photivity from FlashPoint. Details weren't announced on when such a product will roll out.

SNAPSHOT

Seeking Stability

CIOs who are looking for jobs are interested in more than salary and stock — such as the likelihood that the company will still be around a couple of years from now, according to a recent poll.

Some of their top concerns other than salary and traditional benefits include:



SOURCE: SURVEY OF 1,400 CIOS BY RHI CONSULTING INC., MENLO PARK, CALIF.

The top performers in the FORTUNE® Global 500 use Teradata™ from NCR.
Do they see something you don't?

Relationship Technology Solutions. They're bringing the world's most successful companies closer to their customers, suppliers and employees. Six of the world's top ten retailers, seven of the world's top nine telecommunications companies, six of the world's top seven airlines and the world's leading banks all depend on a TERADATA™ Active Data Warehouse from NCR. It makes relationships more powerful and more profitable. From deep in your supply chain, through your network and on out to the customer. It's as big as you need, as fast as you can imagine and more intelligent than anything on the planet. For a closer look, visit www.teradata.com today and get your TERADATA Knowledge Pack. We give you the power to know.

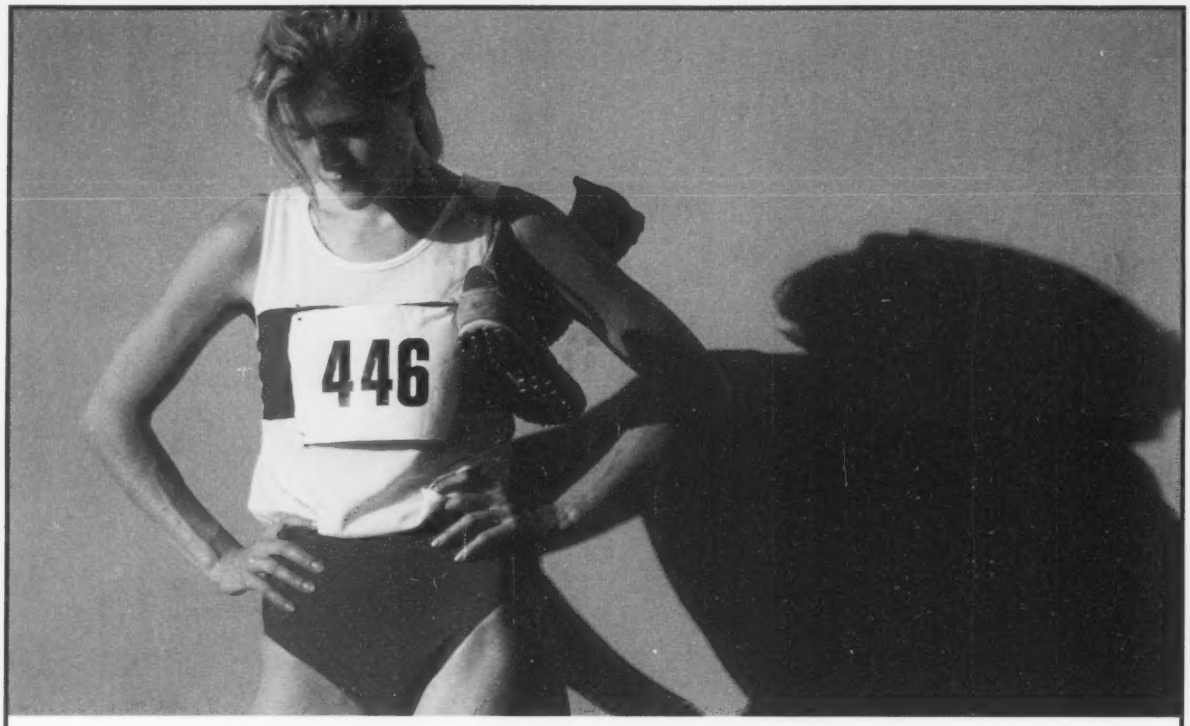
DO YOU KNOW

Introducing Relationship Technology™ Solutions from NCR, the power to know.

DO YOU KNOW

DO YOU KNOW

NCR



When your application hits the Oracle performance wall, how will you scale it?

If you run web applications on a relational database, sooner or later you will run into a wall of speed and scalability limitations.

What are the first signs that the wall is getting close? Maybe your data center starts buying more expensive computers. Or maybe you are suddenly spending money on "middleware".

Before you know it, the costs related to running your relational database are skyrocketing, while your probability of success is plummeting – because relational database technology was never meant to meet the performance demands of today's e-applications.

The best way to scale the performance wall is with Caché, the post-relational database proven to run SQL based applications up to 20 times faster than relational database technology, and to scale up to many tens of thousands of users without sacrificing performance.

Plus, Caché includes a rapid e-development environment, with simple-to-use yet powerful object technology that dramatically accelerates the creation and adaptation of sophisticated web applications.

Caché comes from InterSystems, a specialist in high-performance database systems for over twenty years – with 24x365 support, and over 3 million users worldwide. *Caché is available for Windows, OpenVMS, Linux and major Unix systems.*

World's Fastest & Most Scalable Database.

Download a fully-functional copy of Caché for free at e-DBMS.com, or call 1-800-753-2571 for a free CD.

© 2000 InterSystems Corporation. All rights reserved. InterSystems Caché and e-DBMS are registered trademarks of InterSystems Corporation.

TECHNOLOGY

NUKE KNOWLEDGE

Sandia National Laboratories turns to a new searchable video technology to produce an archive containing procedures on securing nuclear weapons. The fast access is a must for the lab's emergency response team. ▸ 94

HACK OF THE MONTH

As online retailers gear up for the shopping season, it's important that they shore up defenses against hacker attacks, fraud and other threats. Deborah Radcliff offers a reality check and some security advice. ▸ 96

SECURITY JOURNAL

As antivirus software problems continue, Jude wonders if it would be worth the effort to switch to another product. Meanwhile, an approval for new security staff leads to a parade of high-priced talent. ▸ 100

HANDS ON

Kodak's newest digital camera delivers high-resolution digital photography at a lower price than many competitors. It's not the best you can buy, but it will meet the needs of most photographers. ▸ 102

FUTURE WATCH

As researchers contemplate alternatives to silicon, the massive parallelism offered by DNA computing is intriguing. Scientists have solved problems in test tubes, but it's not easy — or quick. ▸ 104

FIELD REPORT: SQL SERVER 2000

According to early users, Microsoft's SQL Server 2000 is a better database management system than those from competitors such as Oracle and IBM. ▸ 115

NEW PATH FOR THE ROUTER?

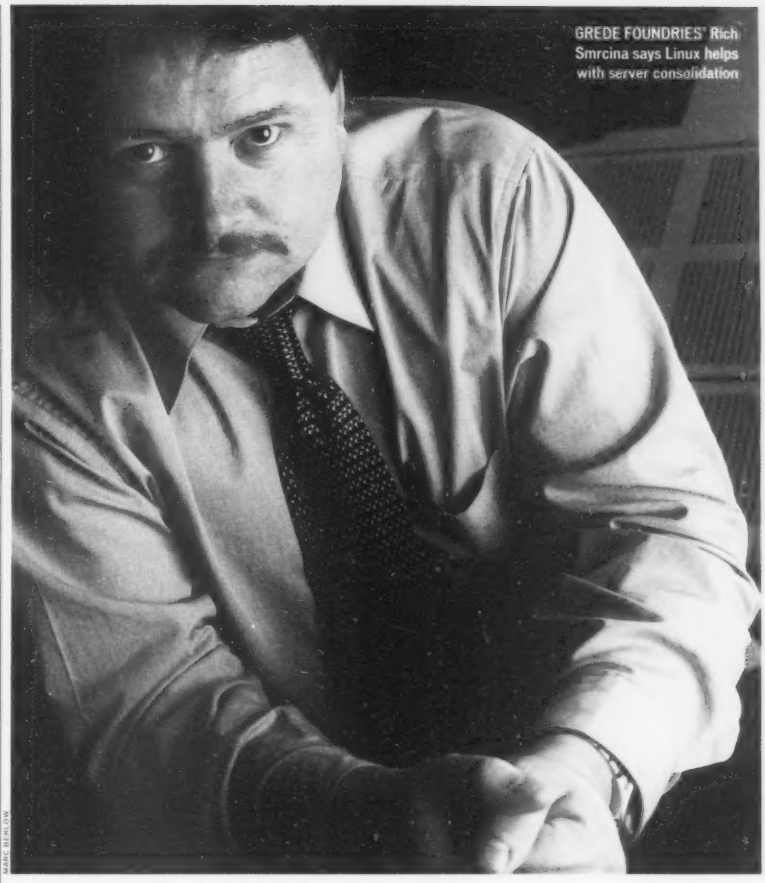
Advocates of competitive technologies claim the router is doomed, but experts question whether it makes sense to move routing functions to small devices. Some want to throw bandwidth at the problem; others say building routing intelligence into other devices will spread the load and make networks more efficient. ▸ 120

QUICKSTUDY

Applets and servlets — small applications often written in Java — can enhance the display and delivery of Web pages. Learn more in this week's tutorial. ▸ 124

JOB WATCH

Only a handful of IT professionals hold the title of chief privacy officer. The job is a new one and is usually held by someone from the legal side. But that's changing, as new privacy regulations affect the storage and handling of customer data. ▸ 127



GREDE FOUNDRIES' Rich Smrcina says Linux helps with server consolidation

MARC BERLOW

LINUX KNOCKS AT THE DATA CENTER

CORPORATE IT HAS FULLY EMBRACED Linux and other open-source products as standard elements in the Internet infrastructure, but most information technology managers haven't deployed Linux inside the data center and say they are unlikely to do so in the coming year. What will it take for Linux to gain access to the corporate data center? 108

BRIEFS

IBM Announces Chip Based on PCI-X

IBM last week announced its first bridge chip based on PCI-X technology. PCI-X is an enhanced version of current Peripheral Component Interconnect (PCI) I/O technology. PCI-X delivers 133-MHz performance, well above the 66-MHz standard on PCI technologies. IBM's PCI-X bridge chip is being targeted for use in storage-area networks and voice and data communication applications, which require high bandwidth and fast I/O.

IBM said vendors that are developing or evaluating applications based on IBM's PCI-X bridge include Adaptec Inc., American Megatrends Inc. and Emulex Corp.

Microsoft Rolls Out Security Server

Microsoft Corp. last week began shipping to early adopters the second release candidate of its Internet Security and Acceleration Server. The company made available both an enterprise edition and a standard edition. All firewall and caching features are the same in both editions, but the standard edition can run on only four processors or fewer, according to Microsoft. The enterprise edition also lets users set enterprise-level security policy and manage server arrays.

The enterprise edition will sell for $5,999, and the standard edition will cost $1,499. Both versions are scheduled for general release early next year.

SyChip to Provide GPS to 911 Service

SyChip Inc. in Warren, N.J., has announced the creation of its GPS2020 Global Positioning System (GPS) chip, a module that's a half-inch by a half-inch and can be built into cellular phones and personal digital assistants to add wireless GPS capabilities. The chip will allow wireless carriers in the U.S. to comply with new Federal Communications Commission regulations that require all cellular phones offered by carriers to identify their locations to within 125 meters (412 feet) for 911 emergency calls by the end of 2002.

Training Assisted By Searchable Video

Federal emergency response team will be able to find clips easily with keywords

BY JAMES COPE

When the U.S. Department of Energy Emergency Response Group practices disarming nuclear weapons, it videotapes the exercises to use for reference and training. Beginning next month, the group will be able to locate specific clips by means of a searchable video database being developed by Sandia National Laboratories in Albuquerque, N.M.

Mike Krawczyk, a software engineer at Sandia, said technicians routinely digitize the videos for storage on the hard drive of a file server. But early next month, the lab will begin archiving video in a searchable database, he said.

One goal, according to Krawczyk, is to store the video in such a way that it can be searched by keywords and phrases recorded on the audio track. Another goal is the creation of a system that permits extraction of specific video segments without having to view the entire video. That would let users extract key points of interest and repackage them as embedded video in PowerPoint presentations.

Krawczyk said Sandia has contracted with Excalibur Technologies Corp. in Vienna, Va., to provide the video capture and search software. The system will run on servers from Round Rock, Texas-based Dell Computer Corp., he said.

"We take the raw videotapes and have a contractor transcribe the audio and give us a document file," Krawczyk explained. That file is then sequenced with the video, which makes the video searchable by keyword.

Krawczyk said searching for the keywords *rendered safe*, for example, displays links to video segments in which those words were spoken by a member of the Emergency Response Group. Clicking on a link starts the video where the audio of keywords begins, he said.

A video technician can then mark frames before and after the key phrase to extract just that segment for use in a presentation or future training exercises, Krawczyk explained.

Phil Lee, an analyst at Raymond James Associates Inc. in St. Petersburg, Fla., said the technology could be valuable to companies such as airlines, which perform complex maintenance tasks.

"Searchable streaming media would be a good way to show how to put in and remove a part," Lee said.

The World Bank in Washington also uses the Excalibur system, according to Eric Engelmann, an information officer at the bank. However, the keyword searching feature is seldom used by his organization, he said.

The presentations and debriefings that the World Bank videotapes are often long, and it would be too laborious to transcribe the text manually, he explained. And although Excalibur does have an audio-to-text conversion engine in its software, Engelmann said it works well only in a controlled environment, such as a prepared speech given from a podium.

Excalibur will load the software on Sandia's computers early next month, Krawczyk said. The system is expected to be operational by Dec. 9.

SANDIA NATIONAL LABORATORIES is developing a searchable video database that will allow keywords to be used to locate segments

HP Licenses IP Network Manager for OpenView

Analysts: RiverSoft NMOS is superior

BY SAMI LAIS

A licensing agreement announced last month between Hewlett-Packard Co. and RiverSoft Technologies Ltd. will improve network management capabilities for users of HP's Network Node Manager for its OpenView enterprise management system, analysts said.

HP will license source code for San Francisco-based RiverSoft's network management operating system (NMOS). It will also join San Jose-based Cisco Systems Inc., a 6% shareholder, as a minority investor. Financial terms weren't disclosed.

RiverSoft's NMOS is "one of the most sophisticated physical modeling programs," said Dennis Drogseth, an analyst at Enterprise Management Associates Inc. in Boulder, Colo.

The program automatically models and monitors topology, configuration and component-change management, greatly speeding network problem resolution, Drogseth said.

"It's been a sore point for network managers that they can't finish polling every device before it's time to start again," said Patrick Dryden, an analyst at Illuminata Inc. in Nashua, N.H. The NMOS addition would speed that process, he said.

The RiverSoft technology might as well be stamped "destination Network Node Manager," said Valerie O'Connell, an analyst at Aberdeen Group Inc. in Boston. "[It] would instantly bring much-needed Layer 2 discovery and mapping capability to Network Node Manager."

The agreement came two weeks after HP announced that it would acquire Bluestone Software Inc., a Web server and application developer in Philadelphia.

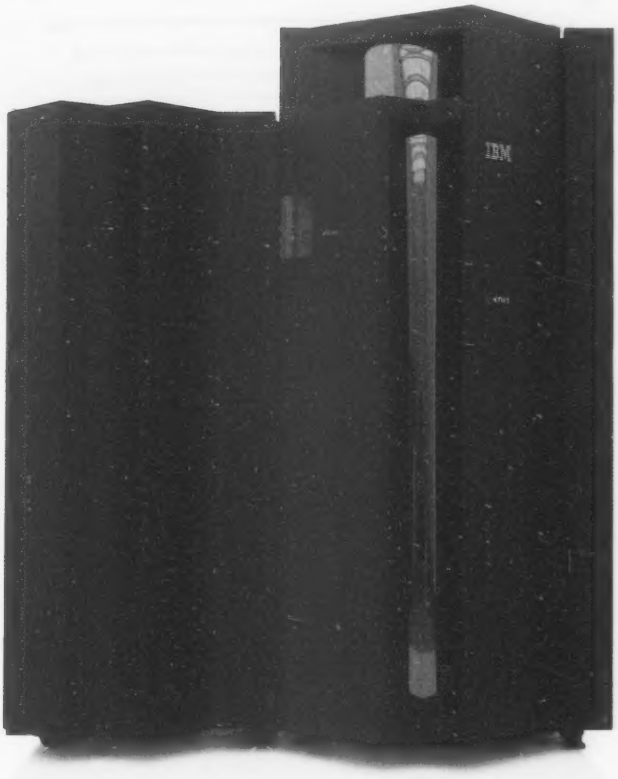
With Bluestone bolstering HP's WebQOS Web server and application manager and RiverSoft extending Network Node Manager, the two agreements constitute "a one-two punch," offering users "a step up in service-level management," said Jonathan Eunice, Illuminata's president.

NEW WORLD
NEW EARTH MOVERS
NEW SERVERS

INTRODUCING THE SELF-MANAGING zSeries 900, THE MOST RELIABLE SERVER ON EARTH.

[@server]

For the next generation of e-business.



IBM

IBM @server zSeries 900
configurations available up to 640-way,
clustered with up to 2TB memory
designed for 99.999% availability

integrated cryptographic coprocessors,
yielding up to 64,000 SSL's per second
automatic system resource reallocation
runs z/OS, Linux and S/390 software

workload-based software pricing
runs Linux virtual servers for as little
as $500/image For full information,
go to **ibm.com**/eserver/z900

DEBORAH RADCLIFF/HACK OF THE MONTH

Take caution this holiday season

LIKE YOU NEED one more thing to worry about during your annual holiday preparations. But now, more than ever, you can't put your security on the back burner.

Here's your reality check: How much would it cost your company if it were to fall off the Internet the way Amazon.com Inc., Yahoo Inc. and others did in February — only it happened to your company on the biggest shopping day of the year? And whose head would roll if, at the height of the shopping season, your company ended up in the headlines because customers' credit-card numbers were posted on the Web, as happened to a half-dozen online businesses in January?

"Imagine if those [distributed denial-of-service] attacks in February really came on the 21st and 22nd of December. It could have been a disaster for online retailers," says Ian Poynter, president and founder of Jerboa Inc., a security services firm in Cambridge, Mass.

In addition to denial-of-service attacks, merchants should also take precautions to protect their shopping-cart applications. "We've done a bunch of application-level [penetration] tests on shopping-cart applications. Getting access to other users' accounts and private information is pretty much the norm," says Ken van Wyk, chief technology officer at Para-Protect Services Inc., a security services firm in Alexandria, Va.

DEBORAH RADCLIFF is a *Computerworld* feature writer. Contact her at deborah_radcliff@computerworld.com.

And there's that little problem of credit-card fraud, something 132 electronic-merchant respondents claimed was present in 4% of their transactions last year, according to Mountain View, Calif.-based CyberSource Corp. in its CyberSource 2000 Fraud survey (*www.cybersource.com*) released last month.

Jean Bruesewitz, senior vice president of advanced risk solutions at Foster City, Calif.-based Visa USA Inc., says fraudulent credit-card use is more dominant in the cyberworld than in any other "card-not-present" medium.

Needs Attention Now

Clearly, now is not the time to divert your attention from security requirements.

The good news is that you can take advantage of current holiday preparations and keep your security work to a minimum. For example, as your company prepares for more traffic, it will likely install redundant fail-over systems, something that already includes more protection against denial-of-service attacks, says Poynter. Just make sure there's a mechanism in place to filter out the offending denial-of-service traffic so it won't roll over with the legitimate traffic, he says.

The problem will be catching denial-of-service traffic before it shuts you down.

"If your traffic increases overall, it becomes difficult to look for the traditional spikes in volume that indicate a denial-of-service attack," says Poynter.

That's why you need a plan. And that plan should revisit such procedures as network monitoring, upstream filtering and other safeguards from your application service provider or Internet service provider and making sure that contact names and numbers are up-to-date, says Poynter. Most important, the plan must include incident response. In fact, practicing your response at least once would be ideal.

As for fraud protections, Visa is piloting an eight-part program designed to curb Internet credit-card fraud called Visa Secure Commerce, which includes compliance, authentication and a "neural network" that will alert online retailers to fraudulent card numbers, among other services.

With a rollout planned for the middle of next year, Visa Secure won't be able to help merchants this season. In the meantime, Bruesewitz recommends that retailers verify the cardholder by requesting the last three digits of the card verification value number on the back of the card in the signature box. She also urges merchants to use Visa's Address Verification Service (*www.visabrc.com/doc.phtml?4,71,327,818_basicard.html*).

For the shopping cart applications, check out advisories such as *www.securityfocus.com/frames/?content=/vdb/bottom.html%3Fvid%3D1237* and patch those applications accordingly. It wouldn't hurt to test the shopping-cart applications by attacking them the way van Wyk's team has.

Now that wasn't too painful, was it? And who knows? You might just keep your head this holiday season.

> If your traffic increases overall, it becomes difficult to look for the traditional spikes in volume that indicate a denial-of-service attack.
>
> IAN POYNTER, PRESIDENT AND FOUNDER, JERBOA INC.

WE BUY USED COMPUTER EQUIPMENT

PACE/BUTLER CORPORATION
800-319-9355
Fax: 405-755-1114
http://www.pace-butler.com
13900 N. Harvey Ave.
Edmond, OK 73013-2431

FAST • FAIR • FRIENDLY • Since 1987

Your Second Source for Sun Microsystems Computers

Servers & Workstations
Tape Libraries & Tape Autoloaders
Disk Arrays
Tape & Disk Drives

WEX
West Coast Computer Exchange, Inc.
11167-A Trade Center Drive, Rancho Cordova, CA 95670
Call 916-635-9340 or Fax 916-635-9485
Call 714-921-5999 or Fax 714-921-4208
Web Site: www.wccx.com, email: sales@wccx.com

©2000 SAP AG. SAP, mySAP, SAP logo are trademarks or registered trademarks of SAP AG in Germany and in several other countries.

ANNOUNCING SOLUTIONS FOR THE *NEW*, NEW ECONOMY.

(YOU KNOW, THE PROFITABLE ONE.)

The promise of e-business is every bit as robust today as it was when the "new economy" was declared. It's just that things that were labeled passé, like planning, infrastructure and profitability, have returned with a vengeance. Welcome to the new "new economy." No company is better suited for this new world of value-oriented e-business than SAP, with our supply chain, collaboration and customer relationship solutions. Out with the "new." In with the "new new." Learn more, type in www.sap.com

THE BEST-RUN E-BUSINESSES RUN **mySAP.com**

SAP

Modeling Software Designed to Cut Project Time and Cost

BY SAMI LAIS

A group of Stanford University professors who formed Vite Corp. say their SimVision project simulation software can predict potential missed milestones, overspent budgets and staff burnout.

Kenneth H. Stowe, project services director at construction management specialist George B.H. Macomber Co. in Boston, has used SimVision to redesign internal project-evaluation processes and plan four projects. He said he selected SimVision after a six-month search. "Based on our experience," said Stowe, "I'd say the kind of savings people can expect from using [SimVision] is about 2% to 4% on a job."

Macomber's average project ranges from $5 million to $200 million, he said, adding that the tool can reduce a project's length by as much as 12%.

Mountain View, Calif.-based Vite "is making more graphical and intuitive the mathematical calculations you can do with this kind of modeling software," said Mathew Light, an analyst at Gartner Group Inc. in Stamford, Conn.

Project software from Artemis Management Systems in Boulder, Colo.; PlanView Inc. in Austin, Texas; Primavera Systems Inc. in Bala Cynwyd, Pa.; and Welcom in Houston also allow some modeling, what-if scenarios and resource planning, Light said.

"What they don't do is target quickly and efficiently which tasks are creating the major bottlenecks. That seems to be where [SimVision] can add value," he said.

Heuristic Method

Most modelers use algorithmic methods, which rely on predefined, immutable rules and conditions, said Raymond Levitt, Vite's chairman and co-founder. SimVision uses heuristics, a method that relies on trial and error to "learn" as simulations run, he said.

To define the range of reactions of each individual involved in a project, the Vite software draws on a database amassed from sources such as MIT and Stanford, which have been collecting such data for more than 10 years, said Robert Drazovich, president of Vite.

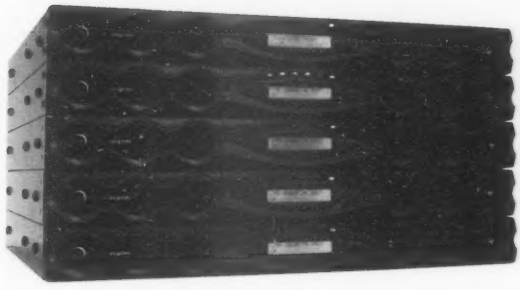
To use SimVision, a company inputs data about its organization, staff, skill levels and other resources — a process that usually takes a few days, Drazovich said. For technologically sophisticated Hewlett-Packard Co., the process took less than a day, he said.

Managers then run the simulation a number of times per user, and outcomes are averaged and presented in a series of graphs, Drazovich said. Users can drill down to see statistics on individual resource use, as well as tweak the model for particular what-if scenarios. The average price for SimVision is $80,000. ▶

VXA
IT'S ALL ABOUT RESTORE
66 GB
6 MB/sec
$899*
SPECIAL OFFER
VXA
30-DAY FREE TRIAL
www.ecrix.com/cw
Say Hello to a Good Buy.
The VXA-1 TAPE DRIVE offers you 3 times the performance and capacity of DDS-3 at about the same cost, and higher performance and capacity than DDS-4 at less cost. Plus, it provides sky-high reliability, unheard of restore capabilities, and compatibility with just about every operating system and software out there. That's what happens when two engineers, who have been pioneering tape drive innovations for a combined 60 years, set out once again to create something just a little bit better. A little bit smarter. And a lot more affordable.
Try it for yourself, free, for a full 30 days. Just go to www.ecrix.com/cw. Or call 800.VXA.TAPE – and say hello.
MSRP for internal drive. External drive pictured, $1,049 MSRP. Specifications assume a 2:1 ALDC hardware compression ratio.
© Copyright Ecrix Corporation 2000. All rights reserved. VXA is a registered trademark of Ecrix Corporation.
Tech Data
TAPE DRIVES BY Ecrix

POWER. BRAINS. LOOKS.

IT HARDLY SEEMS FAIR.



Easy to Manage Server Appliances.

Looking for an unfair business advantage? Then get our new, scalable, high performance server appliances that are only 1U high, built with lights-out remote management and pre-configured so you can just plug them in and go. Because all's fair in love, war, and, of course, business. 877-638-8277

networkengines

www.networkengines.com

©2000 Network Engines

Vendor Support Shocks; Hiring Approval Rocks

Getting the green light for new hires takes Jude away from his company's ongoing vendor issues

Security Manager's Journal

FIRST, a big, hearty "well done" to the Computer Associates International Inc. PR department. I'm beginning to lose track of the number of people e-mailing me asking, "Have you thought of trying InocuLAN?" — and all of the messages are well reasoned and articulate.

But they're missing the point. My problem isn't finding a scanner that's technically better than Norton AntiVirus. I can do that in about 10 seconds flat — Sophos Inc.'s Anti-Virus and Trend Micro Inc.'s ViruScan (OK, and InocuLAN) spring to mind.

My problem is convincing management that the heartache and upheaval of ripping out the existing scanner and rolling out a new one is worth it, especially when our head office isn't seeing the same problems.

More Ammunition

Mind you, I've been handed another piece of ammunition on a plate. At lunchtime yesterday, we got 500 alerts from Norton regarding detections of the memory-resident virus PS-MPC (6). It was a real flood — 500 alerts in just about 15 minutes. All the alerts said "unable to repair this file" — no reason why, no error code, nothing. Just "unable to repair."

The engineer who got the alerts went to Symantec Corp.'s Web site for a description of the virus at *www.sarc.com/avcenter/cgi-bin/virauto.cgi?vid=6662*. It doesn't say anything at all about what the virus does or how to stop it.

So he rings the support line. The first support person says, "Uh, that's not one of our viruses." That statement's scary on quite a few levels. The second support person is equally clueless but alternates with behavior so patronizing, it almost causes our engineer to lose her temper. End result: nothing.

(Does anyone out there know anything more about this virus? What does it do? Should we be worried?)

In the end, we power off the infected workstations to flush the virus out of memory; reformat their hard drives, because it's got to be read into memory from somewhere, but we don't know where; delete the infected area of the server; and reboot. It seems to have worked, but I have no way of telling for sure.

There's an old saying that springs to mind: Why buy a dog, then bark yourself? But that's it. I'm not going to talk about viruses any more. I shouldn't be wasting so much time on a problem so trivial.

The Search for Staff

On to a more joyful subject: recruiting. Yes, after a few months of persuading our management that we need to step up our security efforts, the message has hit home. We've been given the budget to hire four security engineers — one for Windows, one for Unix, one for networks and one for e-commerce. As there wasn't even one security person in the company before I joined this summer, this is a significant step.

I don't know if the situation is the same in the U.S., but in this country, the recruitment market is very fractured. There's a whole host of small agencies, none of which seem to stand out above the rest as being particularly reliable or able to find security specialists.

I do have the names of a few agents who have been good before, but it seems to be down to the quality of the individual agent, not the agency. I'm a bit wary of posting on one of the dot-com services like StepStone or Jobserve, partly because I want to have someone else do the initial screening for me.

I feel that maybe I ought to talk to our internal human resources department, but as I've never been hired by a staffing department or know anyone in information technology who was, I can't really see the point in doing that.

At most companies that have interviewed me, I was interviewed by an agency first, then by the prospective manager and then maybe again by either the next level up of management or occasionally by the people with whom I'd be working. Once you've jumped through all those hoops, you're offered the job — and then they say, "Oh, you've got to go for the formal HR interview first." That doesn't really give the impression that human resources has much say in the decision process.

Still, I presume that that's a catch-22 situation: IT managers don't use human resources because they're not much help, and the staffing departments aren't much help because IT managers don't call them until too late in the process. It would be nice to have someone do a lot of the legwork for me, and they are supposed to be professionals, so maybe I will ask for their help.

I'm also going straight to agencies in case human resources does turn out to be useless. I chose the three that treated me most professionally when I was last job hunting. Does anyone know of a better way to choose an agency?

Almost immediately, I'm confronted with a common dilemma in security recruiting: A résumé arrives from a very young guy with highly detailed technical expertise in certain areas of Unix security. Nothing else on the curriculum vitae — no outside interests, no other areas of technical expertise, almost no qualifications (left school at 16).

So I ask the obvious question and get the predictable response: Yes, he does have a criminal record, but it was a minor offense, he's paid the penalty, he's straight now.

Wanted: Dependable People

He probably knows Unix security pretty well. However, I just plain don't want to employ someone who's shown so clearly that he doesn't abide by rules and regulations. How on earth would I manage him? Besides, we don't really need such in-depth technical security expertise.

The problems we're dealing with aren't exactly rocket science: They're simple matters of patching known vulnerabilities and also distributing virus updates. We don't need bleeding-edge gurus; we need dependable, reliable people who'll get a basic job done. Maybe in a year or so, our security will be good enough to make us need highly technical people. I'll look forward to that.

The Salary Rocket

Of course, we then hit the salary issue. One guy, only a year out of university, wants about $53,000 per year. That's about twice the average salary in this country and more than a schoolteacher might ever earn in a single year. The junior hacker, with no work experience at all, wants even more.

There are a few guys around with half decent experience in security and the right technical areas, but they're looking for $60,000 or $70,000 per year. We'll probably end up paying even more than that, but then my company pays very good rates and expects very good people.

Then the real kicker: I spot two advertisements for short-term contract positions similar to my current job. Very similar, in fact — I doubt I'd have much problem getting the jobs if I applied. Salary? Just over triple my current salary. No benefits, no job stability, loads more stress, but triple the basic. I like my job; I really don't want to move, but triple?

Salaries in this industry are getting a bit silly. ◗

LINKS:

www.computerassociates.com/products/inoculateit.htm: Follow this link for information on Islandia, N.Y.-based Computer Associates' InoculateIT and InocuLAN. A free personal version is available for download.

www.sophos.com: The home page for Wakefield, Mass.-based Sophos, a source for Sophos Anti-Virus software.

www.trend.com: Cupertino, Calif.-based Trend Micro's Web site includes information on mail scanners and gateway scanners, as well as desktop antivirus scanners. You'll also find a free downloadable personal scanner that checks folders for Microsoft Corp.'s Outlook and removes viruses.

www.jobserve.com: I have used Colchester, England-based Jobserve Ltd.'s site to evaluate contract work rates, but postings are only for the U.K.

www.stepstone.com: If you're trying to fill job openings in Europe, London-based StepStone ASA's site is a good place to start.

■ This journal is written by a real security manager, whose name and employer have been disguised for obvious reasons. It's posted weekly at *www.computerworld.com* to help you and our security manager – let's call him Jude Thaddeus – better solve security problems. Contact Jude at jude.t@lycos.com or click on *Computerworld.com*'s Security Watch community forum to participate in discussion topics.

What was I thinking when I sent that email?

Everybody makes mistakes. Take that email you sent out accidentally. If it contained confidential or sensitive company information, you're probably feeling like you have rocks in your head right now.

But fear not. With MailRecall,™ you can get your email back. MailRecall lets you manage the digital rights over your email at all times – even after you've sent it. You decide who sees it, what they do with it, which parts of it they see, how long they see it for, who they can share it with, whether they can print it, save it or forward it – in short, everything about how it is used and distributed.

Why take chances? Find out more about MailRecall.

For a free trial or to order an evaluation kit for your company, visit us at **www.authentica.com**.

Email you can get back – now that's food for thought.

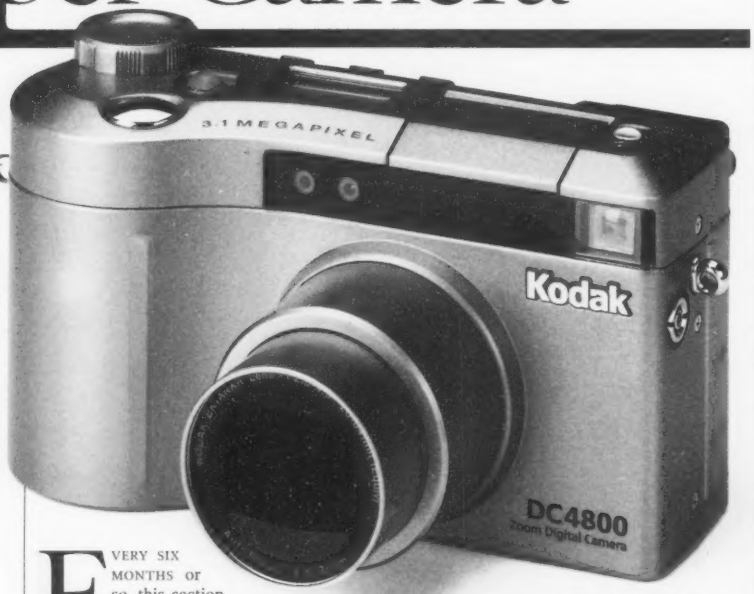
authentica

protect your information

877.532.8060
781.487.2600

Kodak Crafts a Keeper Camera

As digital cameras proliferate, it gets harder for one to stand out from the rest unless it has some exotic features. But here's one that does it the old-fashioned way – on all-around excellence.
By Russell Kay



KODAK'S DC4800 is simple and sleek, matching high-resolution photography with a relative bargain price

EVERY SIX MONTHS or so, this section takes a fresh look at what's newly available in the world of digital photography. I had originally planned to review two higher-end, relatively exotic cameras: Tokyo-based Sony Corp.'s new Mavica, which records on CD, and Melville, N.Y.-based Olympus America Inc.'s new, $2,000, 4-megapixel (MP) Olympus E-10 single-lens reflex. But though these fascinating products have been announced for some time, getting hold of them to review has so far proved fruitless.

What I have found is a sleeper on the market, a digital camera that stands out on the basis of all-around great handling characteristics, high picture quality and a complete line of accessories. To my surprise, this isn't a product of a company like Nikon Corp., Canon Inc. or Leica Technologies Inc., all known for making great cameras, but of Rochester, N.Y.-based Eastman Kodak Co., most of whose cameras over the past half-century have been noted more for their simple-mindedness and even their cheapness. I haven't been particularly fond of Kodak's digital cameras — I've found them somewhat cumbersome to use, with a tendency to eat batteries at an alarming rate.

But Kodak's new, top-of-the-consumer-line DC4800 is an ordinary-looking digital camera that ends up being something special. First, it's a 3.1MP camera, taking pictures at a resolution of 2,160 by 1,440 pixels. It's about average in size (meaning that it's considerably smaller than its DC260, 280 and 290 predecessors), costs just $799, cycles quickly between shots and goes quite a while on its rechargeable batteries. Exposure is easily variable, and you can set a specific f-stop if you want to control depth of field. The 3x zoom lens performs well. Adjustments and settings are easy to make and don't require consulting the manual. The camera has several shooting modes, including one for saturated color and another that produces sepia-toned pictures. I tried these but chose to shoot everything in normal color; it's always possible to change the color balance afterward, using photo-editing software.

Although some digital cameras have accessory lenses available, this is the first one I've had a chance to wring out at some length with a complement of optional telephoto, wide-angle and close-up lenses. (These aren't replacement or true interchangeable lenses; instead, they're auxiliary optics that screw on to the front of the camera's zoom lens.)

Why This One?

As a one-time commercial photographer and photojournalist, I've used many different types of cameras. One legacy of that experience is that I don't have a lot of patience for equipment unless it's quick and easy to use, handles well in the field and takes sharply focused pictures. The DC4800 excels in all those areas, and it just feels good in my hand. What's more, with this machine, I find I don't have to think so much about operating the camera and can concentrate instead on taking pictures. I've used other digital cameras that were quite good, but none of them were 3MP cameras. And as good as those others were, the Kodak DC4800 just seems to feel and work better for me.

On recent vacations to Valley Forge, Pa., and Kansas City, Mo., I found that the DC4800 captured some very nice images. Recording onto a 48MB compact flash card (the camera comes with only a 16MB card), I could get 30 pictures at the camera's highest resolution, without compression, before running out of space. Then I downloaded the pictures to the IBM ThinkPad X20 [Technology, Oct. 16] by plugging the memory card directly into the laptop — easily the quickest and most painless system I've ever used.

The Kodak DC4800 is a great camera for me. It might not be so attractive to you, especially if you have bigger hands, but it's clearly worth checking out. ◗

Much Ado About Megapixels

The state-of-the-art digital camera (at least for cameras you can buy) is at 4MP – cameras that can take photos that contain 4 million individual elements, expressed as a resolution of 2,240 by 1,680 pixels. What this means is you can take such a picture and have large prints made, either by one of the many service bureaus now printing digital photographs or by printing them with one of today's high-quality ink-jet photo printers. And these prints will be just about good enough in sharpness and color quality to rival those you'd get from an average camera using silver-based film.

This level of quality isn't quite good enough for a studio photographer interested in ultimate sharpness and detail, but it's getting there. For a photojournalist, 4MP means that small sections of photos can be blown up considerably without losing information.

If you want to post pictures on a Web site, you needn't worry about high resolution. Most Web photos are considerably less than 2MP or even 1MP, so almost any decent digital camera will be good enough.

The Power Made Simple™

For Business Intelligence
Choose the Power of One

NEEDS	OPTIONS		SOLUTION
Data Mining	Oracle	or	MicroStrategy
Analytics	Business Objects	or	MicroStrategy
Financials	Hyperion	or	MicroStrategy
Reporting	Cognos	or	MicroStrategy
Statistics	SAS	or	MicroStrategy

MicroStrategy 7 delivers the industry's best Business Intelligence performance in one, easy to deploy, easy to use platform.

Data Mining: MicroStrategy's Intelligence Server uses sophisticated data mining techniques that can identify important trends in your business operation.

Analytics: MicroStrategy's analytical engine is able to perform the most advanced analytical queries against any volume of data.

Financials: Microstrategy 7 provides core financial calculations such as mortgage functions, PV and FV functions, capital budgeting, depreciation and currency conversions.

Reporting: Superior reporting capabilities including advanced drilling, table pivoting and flexible formatting allow users to create presentation quality documents and customized reports.

Statistics: MicroStrategy 7 is powered by an extensive library of mathematical and statistical functions, from descriptive statistics such as standard deviation and kurtosis, to hypothesis testing such as t-tests and F-tests.

The Best of All, All in One.

Order your **FREE Evaluation Copy**

Experience the power of MicroStrategy 7 for yourself

www.microstrategy.com/eval

1-888-537-8135

MicroStrategy®
The Power of Intelligent E-Business™

BUSINESS INTELLIGENCE | eCRM | NARROWCAST NETWORKS

© 2000 MicroStrategy Incorporated. MicroStrategy and The Power of Intelligent E-Business are either trademarks or registered trademarks of MicroStrategy Incorporated. All other brands are either trademarks or register marks of their respective brands.

Computing In a Test Tube

As researchers contemplate alternatives to silicon, the massive parallelism offered by DNA computing is intriguing, if not yet practical. By Jan Matlis

DNA COMPUTERS may be the platypuses of the computing world — they're physically unusual, with odd component parts designed to solve special problems. Components of DNA computing include such nonelectronic items as test tubes, enzymes, electrophoretic gels and beads, gold-plated glass slides, E. Coli bacteria and, of course, deoxyribonucleic acid (DNA).

DNA computing was first used successfully in 1994 by Leonard Adleman, a professor at the University of Southern California in Los Angeles, to solve a version of the Hamiltonian Path — the so-called traveling salesman problem. Several other prototypes have been created since then. All of them have been used as proof-of-concepts to solve scaled-down versions of larger, more intractable problems.

Aside from its curiosity value, DNA computing's claim to fame is that it takes advantage of a kind of massive parallelism that isn't available electronically or even optically. Inside a test tube, literally trillions of possible solutions can be generated in parallel. The problems that can be solved, however, need to be rigidly specified. None of these prototypes point a clear path toward mainstream computing.

The Breakthrough

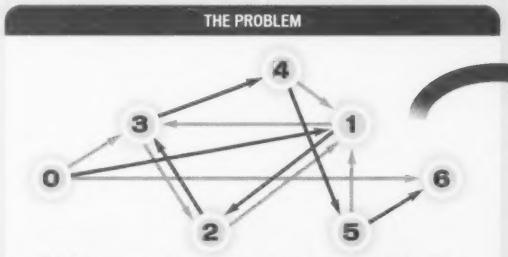
Adleman used DNA to solve a seven-node traveling salesman problem (see illustration). The question was: Given a set of nodes and directed vertices between them, is it possible to construct a path that starts at Node 0, ends at Node 6 and passes through all of the other nodes only once?

It's the kind of resource-allocation question that might get the attention of someone in the front office of an airline.

An enterprising information technology student might be able to take out a pen and solve the seven-node problem more quickly than Adleman's DNA computer, which took about a week. But imagine if the problem involved a traveling salesman who had to visit 200 nodes. Problems like this are called NP-complete problems, meaning their complexity grows exponentially as the

DNA Computing: Step-by-Step

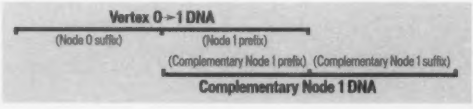
Leonard Adleman, a professor at the University of Southern California, used DNA to solve a seven-node traveling salesman problem like the one in this diagram. The question he asked was: Given a set of nodes and directed vertices between them, is it possible to construct a path that starts at Node 0, ends at Node 6 and passes through all of the other nodes only once? Here is the algorithm that Adleman used to solve the seven-node traveling salesman problem. The whole procedure took about seven days.



ABOVE: The seven-node traveling salesman problem as solved by Leonard Adleman's DNA computer. The solution is shown in green, with the nodes labeled in the order in which they are visited: 0→1→2→3→4→5→6.

IV **The vertex DNA and the complementary DNA are mixed in a test tube. Those strands of DNA that can bind will do so.**

For example, the complementary DNA for Node 0 could bind to part of the 0→1 vertex DNA:



specification of the problem increases linearly in size. When they get big enough, they can stop an electronic computer in its silicon. On the other hand, it has been estimated that using Adleman's massively parallel DNA method to solve a 200-node graph could require a chunk of DNA that weighs more than the Earth.

In solving the seven-node problem, Adleman assigned DNA codes to each element of the problem, which meant one code per node and one related code per directed vertex. In a test tube, he mixed versions of these DNA codes, which annealed to produce an unknown number of solutions, most of them probably wrong.

Adleman then filtered out the wrong solutions by applying a series of criteria that worked logically and could be implemented in a test tube.

Security Threat

The promise of this technique is that any problem that could be posed in a way that corresponds to the one Adleman solved could theoretically be solved as well.

Adleman and others have suggested that this method could be used to crack the U.S. government's Data Encryption Standard (DES), which is used to encode sensitive data for transmission. Employing one of 2^{56} keys, DES is almost uncrackable by the most powerful supercomputers.

But a DNA-based method that could test all 72 quadrillion keys at once might have a chance. Though the DES services company RSA Data Security Inc. in Bedford, Mass., has stated that "with a large enough key, one should be able to thwart any DNA computer that can be built."

A group of researchers at NEC Research Institute Inc. in Princeton, N.J., reported in 1997 that they had constructed a DNA computer to solve a "maximal clique problem" involving six nodes with 11 connections. The question was: Given a set of nodes and a set of connections, what is the maximum number of nodes that are directly connected?

After assigning codes to the components of the problem, generating DNA to match the codes, mixing the DNA so it could anneal and filtering and sorting the DNA, they incorporated the remaining "solution" DNA into viruses and had the viruses infect E. Coli bacteria. The viral DNA in the bacteria multiplied (in the same way that viruses make people sick), and the "solution" DNA was multiplied also. There was then enough to sequence it and find the problem's solution.

> DNA computers are unlikely to become . . . competitors for electronic computers.
>
> LEONARD ADLEMAN, PROFESSOR, USC

Gold-Plated Research

Researchers at the University of Wisconsin in Madison have used another type of DNA computer to solve a "satisfiability problem," in which binary numbers are tested to see if they satisfy a formula and produce "binary true," or the number 1. Their prototype had to test 32 sequences. A problem scaled up by a factor of four would have had to test 1 million sequences.

This effort used DNA strands attached to a gold-plated glass slide so the solution DNA wouldn't be accidentally washed down the drain. Wrong solutions were broken down and washed away.

As has been pointed out, most of these DNA computation schemes involve breaking down the computer every time they are used. Unlike electronic instructions, which can be rerun with the push of a button, there may be more setup required to run a DNA computer.

A programmer who is used to debugging code by running a sample case over and over again may have to come up with a new paradigm. What might, in an electronic environment, appear to be a simple, algorithmic change, such as requiring Adleman's salesman to visit one of the nodes twice, without specifying which node, might, in a DNA environment, require an entirely new system of filtration and sorting, and possibly a different approach to specifying the problem.

"DNA computers are unlikely to become stand-alone competitors for electronic computers," says Adleman.

Their most productive application, suggests John Reif, a professor at Duke University's computer science department in Durham, N.C., might be in streamlining the decoding and processing of natural DNA that's being done in the Human Genome Project and in crime laboratories.

Matlis is a freelance writer in Newton, Mass. He can be reached at jmtgpcmcm@aol.com.

THE SETUP

I **Each node is assigned a 20-base code. The bases consist of the four DNA nucleotides (abbreviated as A, T, C and G); the prefix and suffix for each node must be unique.**

For example, Node 0 could be coded as:

AATCGTTCAG GCTAGTCCAT
(Node 0 prefix) (Node 0 suffix)

II **DNA to represent each directed vertex is generated from the node codes. The suffix of the departure node is attached to the prefix of the arrival node.**

For example, the directed vertex 0➝1 would be:

(Node 0 suffix) (Node 1 prefix)

III **The complementary DNA for each node that was assigned in Step 1 is generated. Complementary DNA is DNA that binds to another strand of DNA. A nucleotides bind with T nucleotides; C's bind with G's.**

Complementary DNA for this example would be:

TTAGCAAGTC CGATCAGGTA
(Complementary Node 0 prefix) (Complementary Node 0 suffix)

If the two strands of DNA were mixed together, they could bind in this way:

AATCGTTCAG GCTAGTCCAT
TTAGCAAGTC CGATCAGGTA
(Double strand Node 0 prefix) (Double strand Node 1 suffix)

THE CALCULATION

That strand could then bind to any vertex strand that starts with a Node 1 suffix. In the case shown here, it binds with a 1➝3 vertex DNA.*

Vertex 0➝1 DNA: (Node 0 suffix) (Node 1 prefix)
Vertex 1➝3 DNA: (Node 1 suffix) (Node 3 prefix)
(Complementary Node 1 prefix) (Complementary Node 1 suffix)
Complementary Node 1 DNA

Note that the way the problem was set up, there are no vertices that have Node 0 as a destination and no vertices that have Node 6 as a departure point. Taking advantage of that fact, Adleman used bits of DNA consisting of either Node 0 suffix and Node 6 prefix and an enzyme to multiply all DNA chains that started with Node 0 or ended with Node 6. That way, in succeeding steps, it would be easier to manipulate the "right" DNA, and the sample would be large enough that it would be unlikely for it to disappear down the drain by accident.

*Note: In this example, the "wrong" vertex DNA bound to the strand, so this strand will eventually be discarded.

THE ANSWER

After the DNA has been incubated for the right length of time at the right temperature, and the set of answers, including the "right" one, has been amplified, "wrong" sequences are discarded.

V **DNA sequences that don't begin with Node 0 are filtered out. The DNA sequences that don't end with Node 6 DNA are filtered out.**

VI **The DNA sequences are sorted by length. Only those sequences that have seven 20-base nodes are kept.**

VII **All DNA sequences that don't have Node 2 DNA are filtered out. All DNA sequences that don't have Node 3, Node 4 and Node 5 DNA are filtered out.**

VIII **If there is any DNA left, it has all the right properties: It starts with Node 0, ends with Node 6, visits each node and has a length that means it only visited six nodes, which implies it visited each node once. Sequencing the DNA will reveal the order of the codes and provide the solution.**

e-business
right here.

Do you really know what goes on in the minds of your e-customers? What they might be thinking about buying? Or not buying? And why? That's where you need e-Intelligence from SAS. With e-Intelligence, you can quickly integrate bricks-and-mortar data with clicks-and-mortar data. To reveal insights that can help you optimize online merchandising, recognize cross-selling opportunities, build greater customer loyalty, and establish more profitable relationships with your very best e-customers. To learn more about e-Intelligence from SAS, and what it can do for your business, phone 1-800-727-0025 or stop by **www.sas.com**.

The Power to Know.™

sas® ™ *e-Intelligence*

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration. © 2000 SAS Institute Inc. 35390US0400

LINUX: Ready For Prime Time?

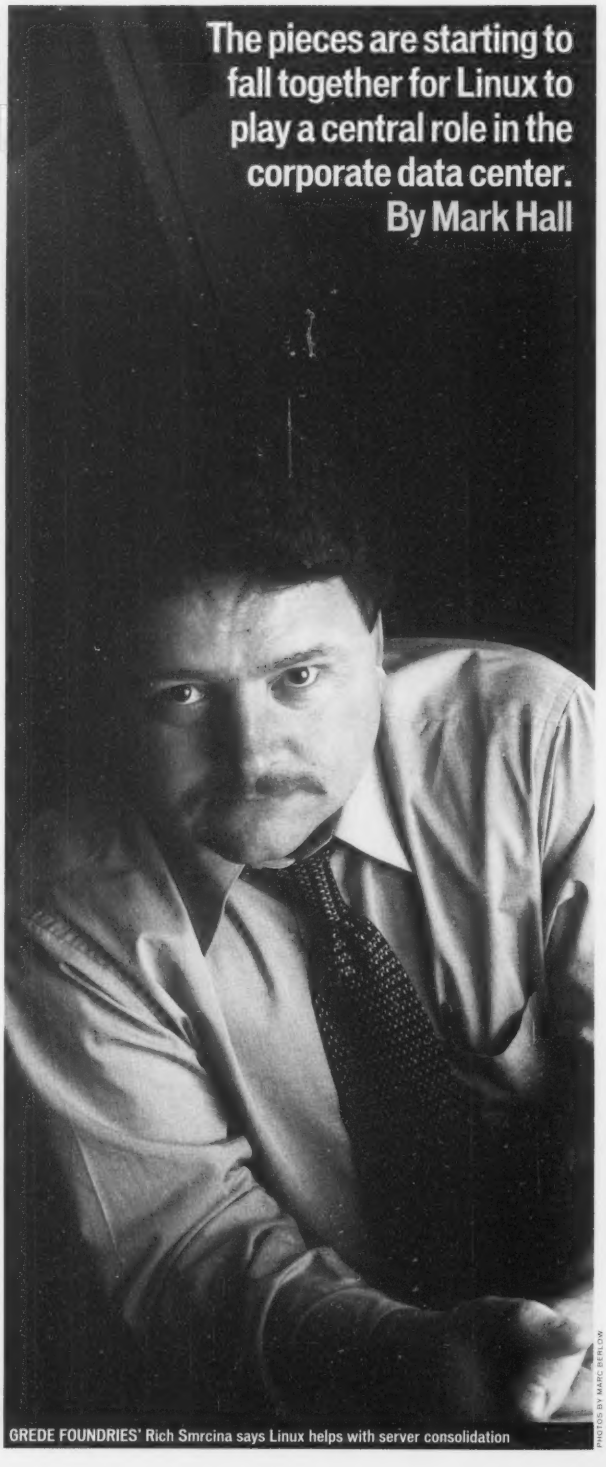
The pieces are starting to fall together for Linux to play a central role in the corporate data center.
By Mark Hall

CORPORATE IT HAS FULLY EMBRACED LINUX and other open-source products as standard elements in its Internet infrastructure, but most information technology managers haven't deployed Linux inside the data center and say they are unlikely to do so in the coming year.

So just what will it take for Linux to gain access to the corporate data center? Right now, Linux lacks several things. The open-source platform needs the multiprocessor support and large RAM capacity necessary for major data center operations. It needs better development tools and packaged applications (those available today pale in comparison with what's available for Windows and Unix). And top management needs to warm to the idea that the open-source operating system can step into a central role in the enterprise.

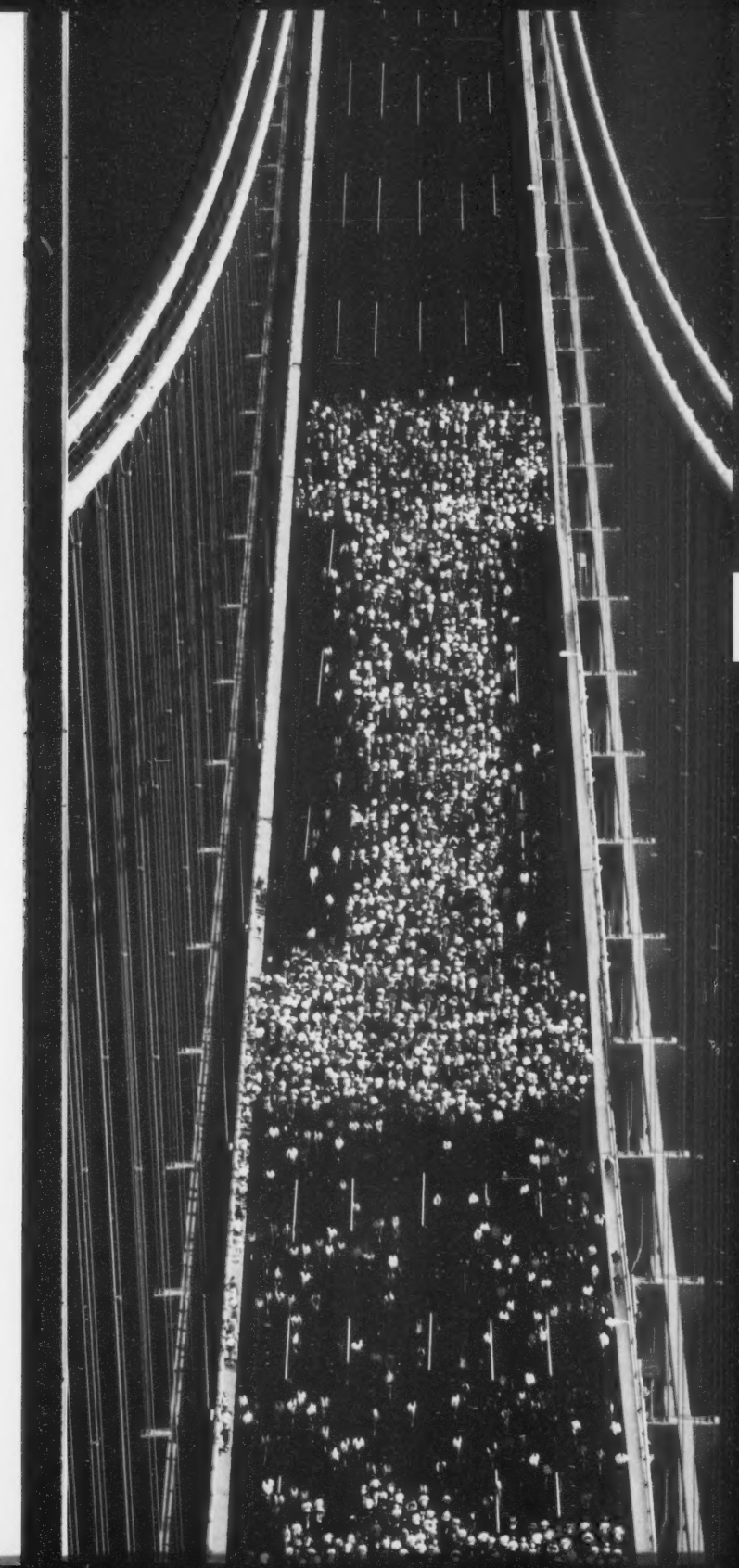
Until that happens, users and analysts say, Linux will remain a profound technology asset for the Internet but not the enterprise.

See Linux, page 110



GREDE FOUNDRIES' Rich Smrcina says Linux helps with server consolidation

PHOTOS BY MARC PERLOW



nspired

Information—it can drive an organization forward. Inspire companies to be more productive, exceed expectations and achieve greater goals. That's the power of i-business. It provides you with an intelligent, real-time view of your overall business. Now companies worldwide can immediately integrate and leverage data from disparate systems and deliver it as useable information via the Web. Every piece of critical data—accessible instantly and on-demand so employees, customers, and partners have the information they need to make better decisions. Information Builders' i-business software solutions add more intelligence to e-business, enabling you to outperform competitors and dominate markets. And in today's fast-paced, global arena that puts you in a truly inspiring position—out in front.

i-business changes everything

Information Builders®

www.informationbuilders.com

1.800.969.INFO

©2000 Information Builders, Inc. All trademarks, registered marks and service marks are the property of their respective owners. All rights reserved.

LINUX: Ready For Prime Time?

Continued from page 108

Linux roared into the spring of this year. Framingham, Mass.-based International Data Corp.'s (IDC) study last year of server operating system market share showed Linux with nearly 25% of the market, up from practically nothing in 1998. With the perpetual delay of Windows 2000 last year, corporate users had plenty of time to experiment and get comfortable with Linux.

This year looked like it would be another great one for Linux, but it turned into a time of crisis for most of the Linux-only players. When the dot-com stock bubble burst in April, the nascent Linux investors took a financial bath. The big three Linux vendors — Caldera Systems Inc., Red Hat Inc. and VA Linux Systems Inc. — plummeted between 80% and 90% in value.

Others suffered more than paper setbacks. Linuxcare Inc. in San Francisco jettisoned its CEO and some employees, scrapped its initial public offering (IPO) and revised its business plan. A very hot prospect, Brisbane, Calif.-based TurboLinux Inc., slashed its workforce of 2,000 employees in half, replaced its CEO and had to pull back from the IPO arena.

Linux's reputation also suffered outside of vendors' business woes. Technically, the operating system lagged its competitors in key technology areas. The current Linux kernel can't manage more than four Intel processors — barely an entry-level system in today's data center. The next release, Version 2.4, is said to be able to handle eight-way Intel systems. That's impressive, but it's still well behind Unix and Windows 2000. Memory capacity will also get a bump up from its paltry 4GB limit to a competitive 64GB. But the release is running late, which is slowing Linux's momentum.

It also doesn't help that Linux lacks broader application support. IDC analyst Dan Kuznetsky puts it bluntly: "Linux simply needs more packaged apps."

Finally, Linux lost much of IT managers' attention this year as Microsoft Corp. finally released its new flagship operating system piecemeal throughout the year. According to Kuznetsky, during the next two to three years, fitting Windows 2000 into the enterprise will be a more pressing matter to IT managers than experimenting with Linux.

That said, Kuznetsky adds that he believes Linux "is making it in the corporate world." He points to its increasing IT workload as the operating system for Web, firewall, page caching and other Internet-related servers. He says he doesn't expect to see many companies the size of Burlington Coat Factory Warehouse Corp. deploying the operating system so pervasively as the retailer has in its Burlington, N.J., headquarters and its hundreds of stores. But Linux, Kuznetsky says, doesn't need that kind of support to grow. Indeed, with its solid foothold in IT, Linux today is well positioned to gradually take on greater responsibilities in the data center.

> Linux got a bad rap that it was harder to use than Windows.
>
> DENNIS POWELL, AUTHOR, CONTRIBUTOR TO LINUXPLANET.COM

Making Inroads

Linux is a big hit with Milwaukee-based Grede Foundries Inc. The $600 million iron and steel manufacturer has shifted the lion's share of its Internet infrastructure to Linux running on an IBM S/390 mainframe. Linux currently handles domain-name server functions for the corporate virtual private network, runs sendmail for company e-mail, supports Apache Web servers and monitors some network tasks.

Grede's manager of operations, Rich Smrcina, says bringing these services onto the mainframe helps with his company's ongoing server consolidation strategy by saving hardware costs and data center real estate. But the company isn't ready to port business or manufacturing applications to Linux yet. Even at Grede Foundries, where Linux is a demonstrable success, top executives remain on the fence.

"The jury is still out inside [IT] here," Smrcina says. "Not everyone is completely sold yet."

At New York-based Amerada Hess Corp., where cutting costs is a corporate constant, Jeff Davis says he believes Linux is a perfect tool. The company had ported its own proprietary seismic-data analysis application to Unix before beginning a migration to Linux two years ago. As a result, the senior systems programmer for the $10 billion energy giant's exploration division says his group replaced $3 million to $4 million worth of leased Unix systems with a $700,000 Linux cluster of 200 two-processor Intel machines.

"Not only did we save money, which everyone around here really likes, but we got 10 times the capacity," Davis says. Still, mainstream business applications remain on non-Linux systems.

Linux has even more momentum outside the U.S., particularly among fast-growing Internet companies. In Germany, the best-known public dot-com business is Web.de AG in Karlsruhe. According to CEO Matthias Greve, the company chose Linux to run its Web-based business because it kept hardware costs down.

Each of Web.de's 200 Linux boxes is equipped with 1GB of RAM and 70GB drives. Its database server, which handles more than 5 million unique users per month, runs Oracle Corp. software and has terabytes of storage online.

Greve says his Linux data center cost less than one-fourth of what it would have had he ordered similarly configured Unix systems from Sun Microsystems Inc. However, had Sun's RISC hardware been more affordable, his company might be running Solaris and not Linux, he says, suggesting that costs drive business decisions to work with Linux rather than any inherent advantage of the operating system.

If Not Now, When?

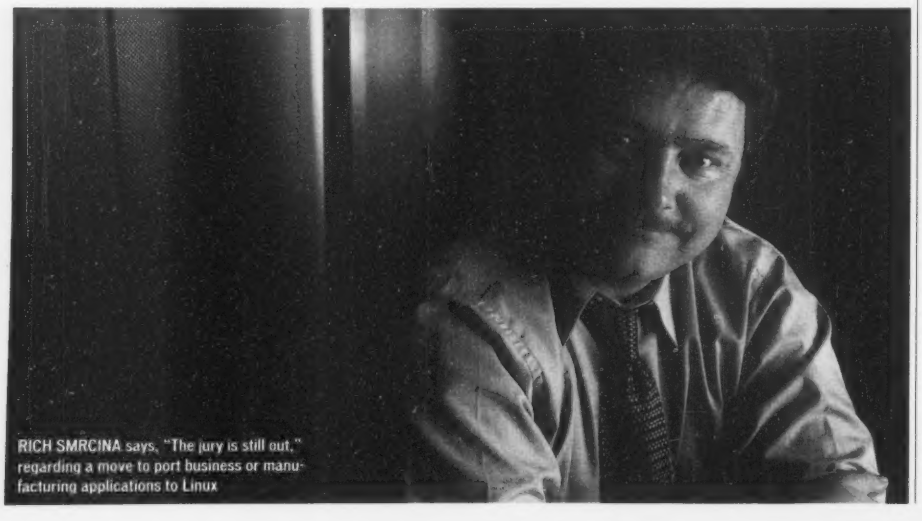
Linux is a heavyweight operating system for Internet operations. But some wonder when, if ever, it will transcend the inherent problems that have kept it primarily in that niche.

According to Dennis Powell, an author and contributor to LinuxPlanet.com in Darien, Conn., "Linux got a bad rap that it was harder to use than Windows." Worse, Powell says, are the battles among the various distributions that can create version incompatibilities and cause concern and confusion among IT planners.

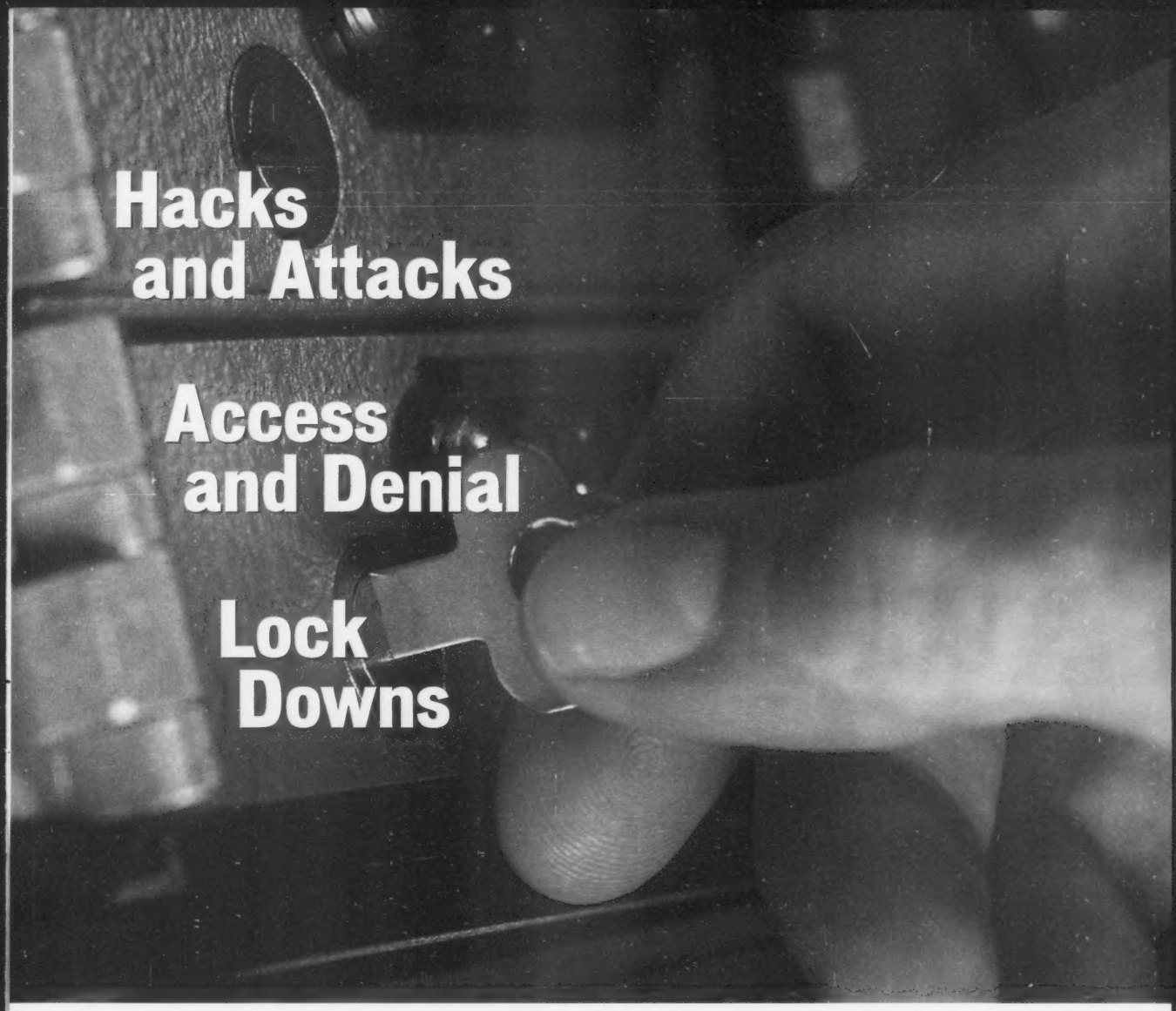
"Linux is too amorphous for corporate strategists," says Harve Tannenbaum, an analyst at Boston-based Summit Strategies Inc.

Broader acceptance may have to wait

See Linux, page 112



RICH SMRCINA says, "The jury is still out," regarding a move to port business or manufacturing applications to Linux



Unlock your FREE Weekly Update

COMPUTERWORLD
Security Newsletter

www.computerworld.com/newsletters

LINUX: Ready for Prime Time?

Continued from page 110

for more enterprise-class applications to arrive. Burlington Coat Factory CIO Mike Prince's experience underlines this problem. He says that until recently, there has been a "time lag" between when vendors release applications for other platforms and when they arrive for Linux. But now, he claims, companies like Oracle and PeopleSoft Inc. release Linux versions on the same schedule as other platforms.

This is true for Linux running on Intel-based systems. But users running Linux on other processors aren't as well off. Although Smrcina says he's quite happy to run Internet operations on Linux inside his S/390, he wants to do more. But he must wait until IBM releases its middleware for Linux on mainframes. He says he expects to be experimenting with DB2 and MQSeries products when IBM ships Linux versions early next year.

Big-Time Backers

Despite Smrcina's impatience, he says he's been impressed with IBM's and other vendors' commitments to Linux. When IBM rolled out its new 64-bit Z900 mainframe last month, he says, Linux "got equal billing to other environments." Prince concurs, adding that Oracle's latest product introduction featured Linux on the same footing as Unix and Windows.

The marquee list of companies that have lined up behind Linux is impressive. All of the major systems makers offer technical support for Linux on their machines. And Linux companies that were drowning in red ink earlier in the year have been given significant cash infusions by industry giants.

Linux is also leveraging its position as the operating system for server appliances, says Tannenbaum. Like LANs and PCs, he says, "Linux is getting into corporate America through the back door."

And Linux isn't limited to large IT shops with strong internal technical support, according to Kuznetsky. In the small and medium-size business market, value-added resellers have been shedding themselves of Novell Inc.'s NetWare, The Santa Cruz Operation Inc.'s systems and other platforms in favor of Linux, while Windows continues to hold its own, Kuznetsky says. And major developers such as Oracle have jettisoned marginal platforms, such as NetWare, for Linux.

So next year is beginning to look like a good one for Linux. Will it be the big year that Linux makes inroads into the data center? Probably not. But it might just be the year that all the pieces come together.

Need help with your IT related buying decisions?

White papers can help!

Search and browse the database of over 7,000 white papers, case studies, and research reports from leading industry vendors and analysts! With IT Reports, you'll get the full scope of information on cutting-edge products and services relevant to your technology interest.

Topics include CRM, E-commerce, ASPs, Outsourcing, Linux, Network Security, Internet, Wireless, and Recruiting and Training.

Computerworld IT Reports

http://itreports.computerworld.com/cw1

Want to feature your white paper on Computerworld's IT Reports?
Send an e-mail to cw1@bitpipe.com,
and we'll show you how.

COMPUTERWORLD

bitpipe
www.bitpipe.com

http://itreports.computerworld.com/cw1
Content for Computerworld IT Reports provided by Bitpipe

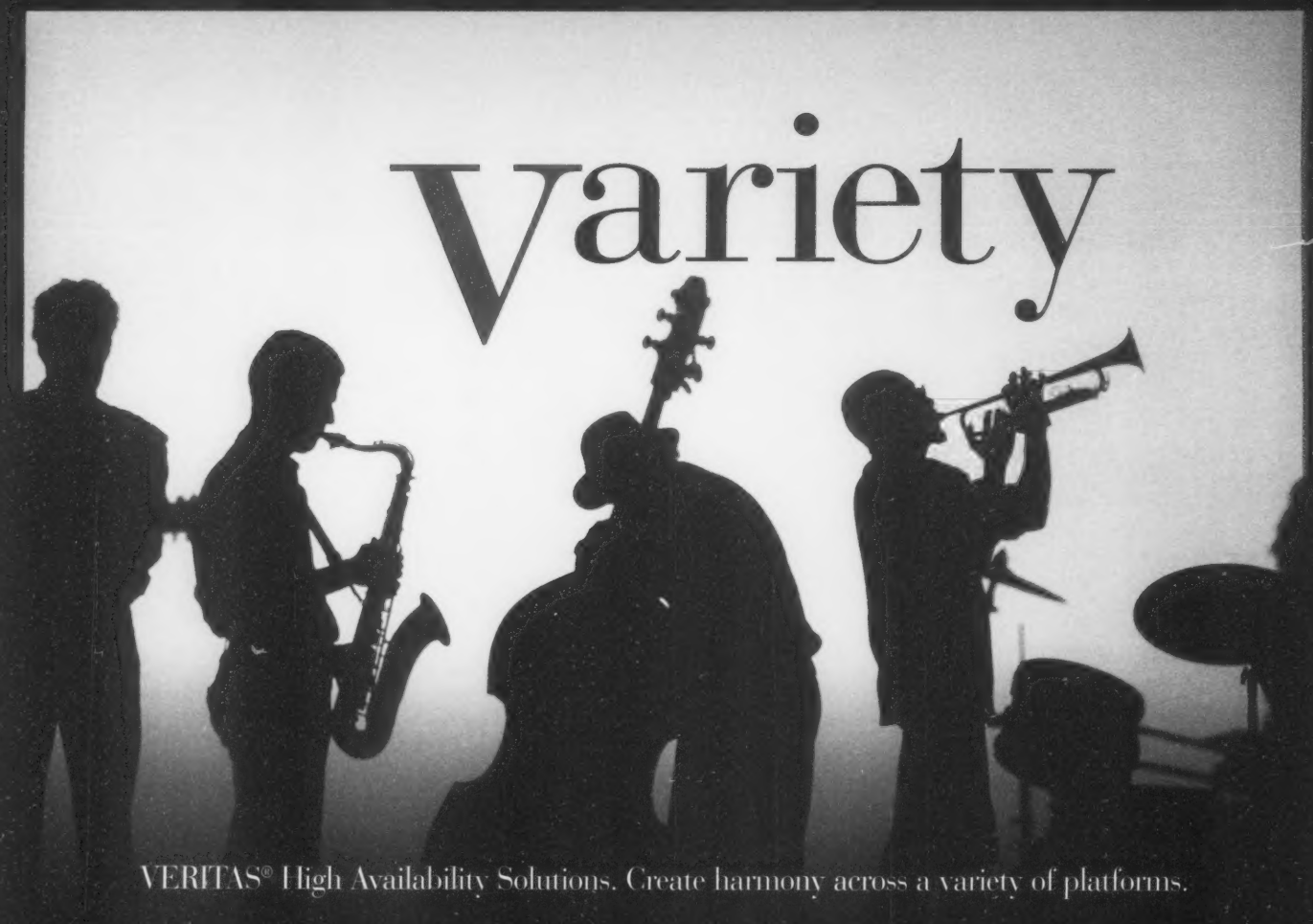
Have you been the victim of dirty birds?

Get Maryville Technologies. If you've been dumped on by "body shops" portraying themselves as system integrators, or big consulting companies "reengineering" your molehills into mountains, let Maryville Technologies help you avoid another mess. In an industry filled with pigeons, we are uniquely trusted by our clients to architect and deliver solutions that meet complex enterprise needs. For integrity, reliability, scalability and performance...get Maryville Technologies. ***www.maryville.com***

Maryville™
TECHNOLOGIES

Enabling Enterprise Performance™

1.800.500.1103



VERITAS® High Availability Solutions. Create harmony across a variety of platforms.

VERITAS High Availability Solutions. Best-in-class.

From UNIX® to Windows® 2000 or Windows NT®, VERITAS offers you a virtual symphony of hardware-independent HA solutions to maximize availability across your enterprise. And only VERITAS integrates critical components of clustering and online storage management software to help you create a stronger HA solution. With the industry's most versatile HA solutions at your fingertips, VERITAS, The Data Availability Company™, delivers maximum business uptime with the most complete availability solutions.

Visit www.veritas.com to learn more about our proven High Availability Solutions!

VERITAS™

BUSINESS WITHOUT INTERRUPTION

1-800-729-7894 code: 864191 | www.veritas.com

SQL Server: THE SEQUEL

Early adopters of SQL Server 2000 report that this newest Microsoft database is better than its predecessors — and better than Oracle or DB2. By Barry Nance

IT'S BEEN A LONG TIME since Microsoft Corp. first entered the database world with a relabeled version of the Sybase relational database management system. From its humble beginnings, the Microsoft product has taken over the SQL Server name (Sybase Inc.'s SQL Server is now called Sybase Adaptive Server), lost all traces of Sybase programming, gained features that rival those of Oracle and become an integral part of Microsoft's back-office strategy.

It's not perfect, of course. SQL Server 2000 runs only on Windows NT 4.0 or 2000. It lacks IBM DB2's high level of support for static SQL. It can't run stored procedures as flexibly or as powerfully as Oracle can. Its native programming interface isn't as well-known as Oracle's. It doesn't integrate as easily as Oracle, DB2 or Adaptive Server with Java-based application server environments such as San Jose-based BEA Systems Inc.'s WebLogic or IBM's WebSphere — especially if they're based on Enterprise JavaBeans.

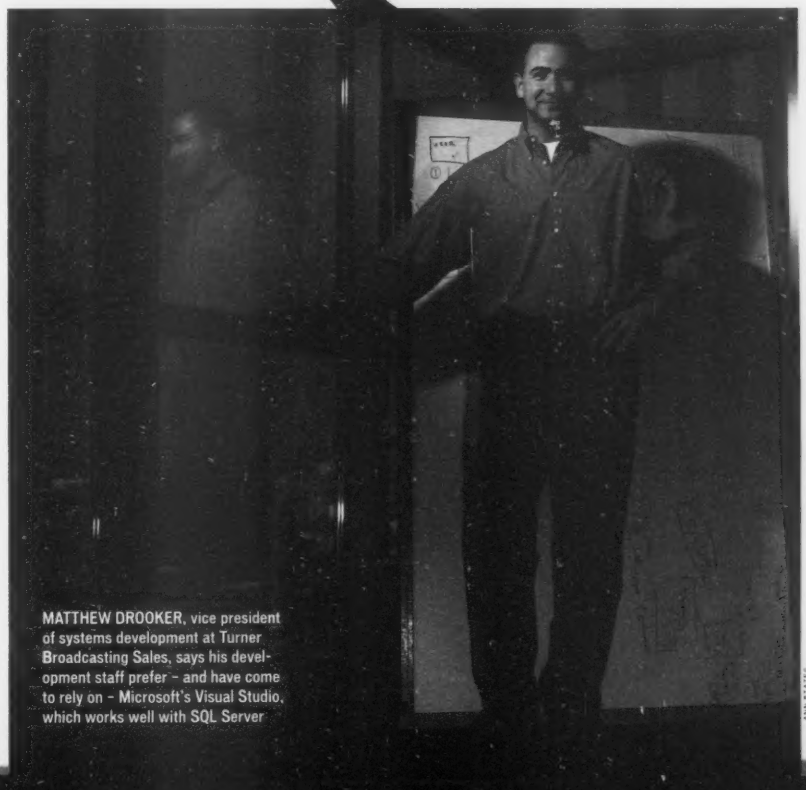
Despite these and other shortcomings, early adopters of SQL Server 2000 say they're pleased with the new version of Microsoft's RDBMS. Microsoft recently shipped the newest upgrade of its premier database, and *Computerworld* approached four early adopters to see how satisfied they are so far. Their reactions were distinctly positive.

This profile of early SQL Server 2000 use shows why, at least at the large workgroup level, Microsoft appears to be ready to make significant inroads against entrenched competitors like Oracle Corp.

Microsoft Builds on Server Side

"We're at a point when people are waking up to how powerful Windows NT, Windows 2000 and Microsoft's server-based products are. The whole Unix and Java world has been overhyped," says Will Zachman, an analyst at Stamford, Conn.-based Meta Group Inc. "In contrast, Microsoft has been steadily building and improving its server-side products, such as SQL Server 2000, to be able to give customers useful and reliable software."

Zachman describes SQL Server 2000's



MATTHEW DROOKER, vice president of systems development at Turner Broadcasting Sales, says his development staff prefer – and have come to rely on – Microsoft's Visual Studio, which works well with SQL Server

ANN STATES

SQL Server: THE SEQUEL

market potential as almost limitless. "I'm very impressed with what Microsoft is bringing to the table," he says.

Matthew Drooker, vice president of systems development at Turner Broadcasting Sales, says his cable TV advertising sales organization chose SQL Server 2000 because his development team has a lot of experience with earlier versions, the system integrates well with the team's tools and it's an appropriate solution for storing sales data from his approximately 220 users. The database stores information about advertisers, advertising agencies, sales orders and broadcast details in about 300 tables.

Turner Broadcasting Sales is a division of Turner Broadcasting System Inc. (TBS), a subsidiary of New York-based Time Warner Inc. Atlanta-based TBS is a leading cable TV content provider and owns outlets such as TNT, Cable News Network Inc. and the TBS Superstation.

When the sales staff and company executives needed a more efficient way to both create and access sales data, TBS developed a set of applications based on SQL Server 2000.

Drooker characterizes TBS as a longtime user of SQL Server and Windows. He has a small group of developers — about 10 people — which he says definitely prefers and has come to rely on Microsoft's Visual Studio 6.0, including Interdev, Visual Basic and Visual C++.

Zachman says he agrees that Visual Studio 6.0 and SQL Server 2000 are an excellent combination. "Microsoft has server-side development tools that blow away anything other vendors have. IBM's VisualAge, for example, is primitive in contrast," he says.

TBS's sales-oriented applications generate proposals, track orders, produce reports and interface with legacy billing systems that run on its Unisys Corp. mainframe. Drooker says SQL Server's Data Transformation Services (DTS) component has been a great time-saver in building and processing interface files. Little programming expertise or effort is required to use the graphical DTS tool to produce programs that convert files from one format to another.

The tool, he says, produces Visual Basic code, which means his team can add business logic quickly and easily.

In addition, Drooker says, the integrated and easy-to-use programming environment surrounding SQL Server lets the development team build effective work-arounds for problems that previously may have required the use of expensive consulting help.

Shopping for a New DBMS

Scott Mitchell, chief technology officer at Home Shopping Network (HSN) in St. Petersburg, Fla., chose SQL Server 2000 primarily for its scalability. He says he likes being able to add horsepower in fine, inexpensive increments by simply buying additional Intel-based servers.

"It increases our agility and improves our ability to change in response to market forces," Mitchell explains. "The Windows programming environment affords me access to a more robust labor market. It also greatly simplifies vendor management, because I'm not tied to a single hardware vendor and a single flavor of Unix."

In May, Mitchell says, HSN decided to migrate the database tier of its Web site's e-commerce application from Solaris-based Oracle running on Sun Microsystems Inc. computers to SQL Server 2000 and Windows 2000 Advanced Server running on Intel-based servers.

Mitchell echoes Drooker in describing the ease of programming in the Windows environment, which has reduced the time it takes to add improvements to the HSN Web site. The database tier migration took less than six weeks. Mitchell says HSN has also seen improved performance, simplified vendor management and reduced hardware, software and support costs.

Like TBS, HSN runs its core business — including inventory, order management and fulfillment — using a series of legacy applications running on a Unisys mainframe. To extend this functionality to the Internet, HSN used to rely on a mixed-platform solution a third party developed for the company.

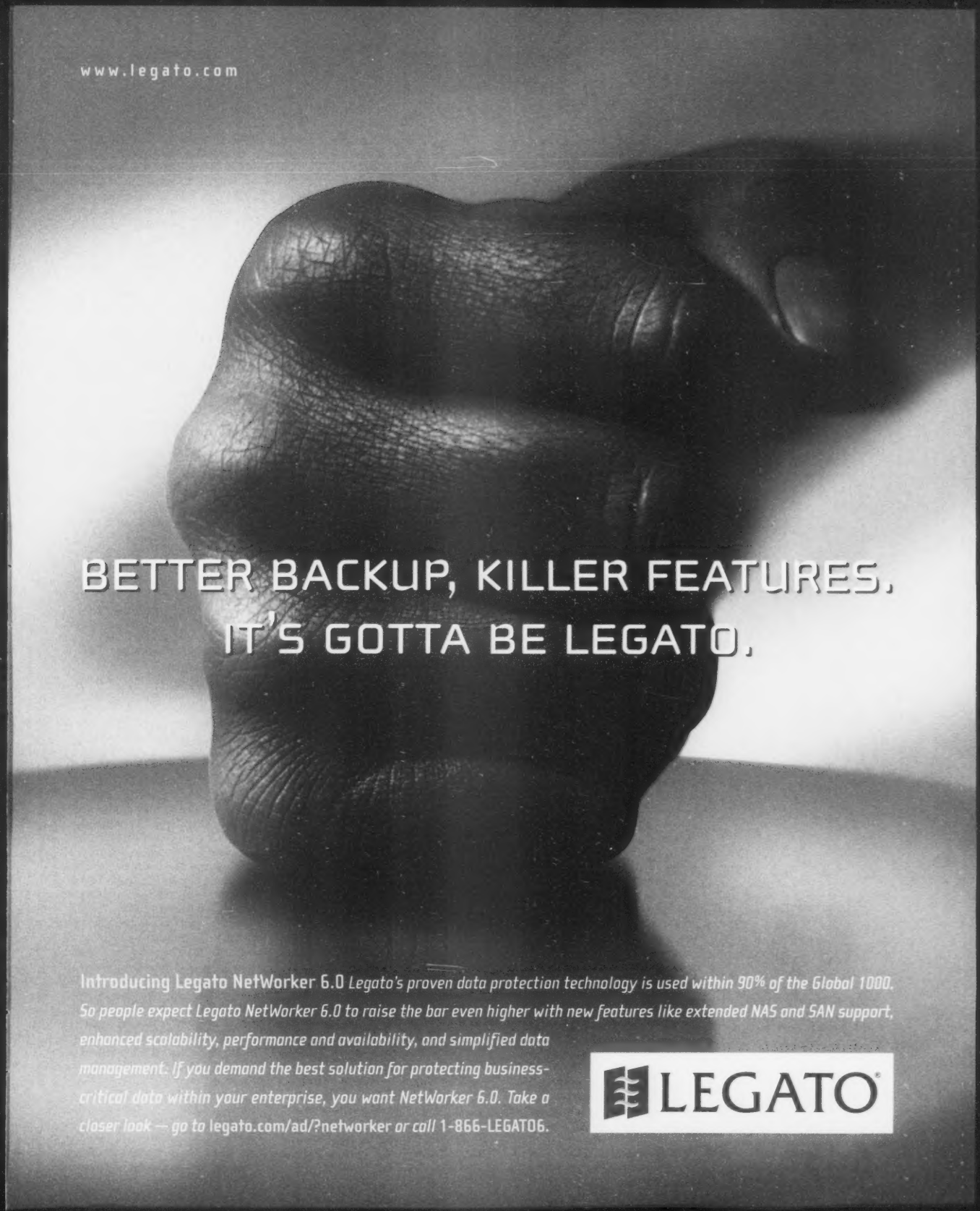
The presentation and business-logic tiers of HSN's Web solution consisted of Microsoft Internet Information Server and Windows NT running on six two-processor Intel-based servers. The HSN Web site processes about 18 million page views per month, and that number is growing rapidly.

The data tier, consisting of catalog data, the customer database and community content such as the site's message boards, resided in Oracle8i running on a Sun computer. Information transfer between the Web platform and the mainframe was accomplished through twice-daily bidirectional batch transfers; new orders were sent from the Web platform to the legacy system,

See SQL Server, page 118

SQL SERVER 2000 VS. THE WORLD

PLATFORM/ CONSIDERATION	SQL SERVER 2000	ORACLE, DB2 OR ADAPTIVE SERVER
Scalability	Buy more Windows NT or 2000 computers	Buy fewer but larger and more expensive computers (Unix or MVS)
Platforms	Any manufacturer whose machines run Windows NT or 2000	Oracle runs on about 92 platforms, including Unix and Windows NT and 2000
Programming expertise	Windows NT and 2000 programmers are readily available	Oracle's API is well-known, but programmers are Unix-flavor-specific
Static SQL support	Not great	DB2 excels
Stored procedures	Not great	Oracle excels
OLAP support	First-class; built-in	Not great
Development tools	Plentiful and high-quality, from Microsoft and third parties	The best tools run on Windows NT and 2000
Importing flat files	Data Transformation Services is superior	Hire another programmer or two
Application servers (BEA Systems' WebLogic or IBM's WebSphere)	Little support	Easily integrated
Java support	Don't bother	Excellent support


www.legato.com
BETTER BACKUP, KILLER FEATURES.
IT'S GOTTA BE LEGATO.
Introducing Legato NetWorker 6.0 Legato's proven data protection technology is used within 90% of the Global 1000. So people expect Legato NetWorker 6.0 to raise the bar even higher with new features like extended NAS and SAN support, enhanced scalability, performance and availability, and simplified data management. If you demand the best solution for protecting business-critical data within your enterprise, you want NetWorker 6.0. Take a closer look — go to legato.com/ad/?networker or call 1-866-LEGATO6.
LEGATO®

SQL Server: THE SEQUEL

while inventory levels and order status were sent in the opposite direction.

Mitchell says HSN was experiencing system performance and availability problems, and the mixed solution made it more difficult and time-consuming for developers to fix problems and optimize performance. Having multiple vendors and support organizations added complexity, and staffing was also more difficult because HSN needed to recruit people with expertise with two very different systems.

In August, HSN replaced the Sun/Oracle data tier with a cluster of two Compaq Computer Corp. 8500 servers, each populated with four processors running Microsoft Windows 2000 Advanced Server and Microsoft SQL Server 2000.

The two-node cluster, which accesses shared external disk storage, is configured in an active/passive fail-over configuration to maximize availability, using the fault-tolerant functionality provided in SQL Server 2000. HSN selected the eight-processor-capable Compaq servers so it could scale up to meet customer demand by simply adding processors, says Mitchell.

Growing Acceptance

Cary Gottesman, a Microsoft consultant at AT&T Growth Markets in North Brunswick, N.J., says AT&T selected SQL Server 2000 primarily because of its online analytical processing (OLAP) capability, its performance and its greater maximum database size. He says SQL Server 2000's increased cube-size limit (over SQL Server 7.0) makes it the right tool for the job.

AT&T Growth Markets, an $8 billion business unit of the AT&T Business Services division, depends on what it calls its Attack Database to provide a wide array of information to field sales personnel. First developed using SQL Server 7.0, this database provides access to just under 1 terabyte (TB) of data that sales staff use to quickly identify and target new telecommunications business opportunities.

Accessed via a browser-based front end, the database provides OLAP and other functionality that lets sales representatives see, for example, what kinds of communications services a business has, the potential revenue a customer may offer and the existing infrastructure that will shape a customer's choices.

Gottesman says database usage is spreading quickly among AT&T's sales force. Moreover, the database's size has grown to include new information from internal sources, such as AT&T billing records, and external information from business and financial profiling services. It currently contains more than 40 million rows in a star/snowflake design that facilitates OLAP views of the data. For example, sales staff can choose to view customer data based on demographic category, industry or region.

Individual customers are represented in 24 million of the 40 million rows. With SQL Server 7.0, Gottesman points out, AT&T Growth Markets was able to support only a few million customers. However, the Analysis Services in SQL Server 2000 can scale up to tens of millions of customers in multidimensional OLAP and more than 100 million in relational OLAP.

Gottesman says the success of the Attack Database has created additional challenges. Keeping the information fresh requires rebuilding about 500GB of the database on a monthly cycle. The entire data warehouse exceeds 1TB when all tables, indexes and OLAP cubes are included.

According to Gottesman, switching from RAID Level 5 to RAID Level 0 gave AT&T its biggest performance gains in the database-rebuilding operation, dropping the time for a single clustered index build from 32 hours to four hours. A faster server further reduced the time to one hour. And switching from SQL Server 7.0 to SQL Server 2000 shrank the index build time even further, to only 15 to 20 minutes. The monthly database-refresh cycle that used to take more than four weeks today takes about a week.

A Vote for SQL Server

Gregg McGilvray, chief technology officer at Election.com Inc., says he feels that SQL Server 2000 scales well, is less expensive than comparable databases and has better tool support in the developer community.

Election.com is a global Internet election-services company in Garden City, N.Y., that provides public- and private-sector election services for governments, associations, nonprofit organizations, labor unions, school districts, credit unions, pension funds and corporations.

The company helps voters around the world make the transition from paper ballots to online voting. Clients include the Sierra Club, the United Nations Federal Credit Union and the Arizona Democratic Party. As the company expands into different markets, it's taking on much larger elections in the U.S. and abroad on a regional, state and national level. These business opportunities represent enormous variations in the number of votes being counted.

"Depending on the bylaws of a particular organization, we may need to build additional tables, add data types, manage indexes and otherwise adapt to constantly changing elements to meet the needs of our clients," McGilvray says. "SQL Server 2000 helps us to do that with an easy-to-understand interface. It's also a lot more cost-effective than the alternatives."

McGilvray says Election.com chose SQL Server 2000 because it provides both the flexibility to rapidly adjust its offerings to different election-format scenarios and the scalability to assist the company in handling major jurisdictional elections.

One of Election.com's largest projects was the recent Youth-e-Vote 2000, an online election for U.S. school children, who were able to vote for the next U.S. president just prior to the actual election.

"That's an example where we were awarded a project that has very different requirements than a standard election," McGilvray says. "We had to add additional tables and reporting mechanisms at different levels in the system. SQL Server enabled us to do this very quickly and to deploy the online voting system in time to meet the requirements of the project."

Passing the Test

McGilvray's team has successfully stress-tested its voting application at 20 million votes per hour.

"The OLAP function in SQL Server 2000 is already helping us in creating rapid election-reporting services. It's also opening up new ways to interpret voter data and voting patterns," he says, adding that the company also exports SQL Server-based data to Excel spreadsheets and uses Visual Basic to generate reports.

"For example, we can look at how often people tend to vote for the first person on a ballot simply because of that position on the ballot," McGilvray says. "If we uncover a high percentage of this kind of voting behavior, then we can offer to rotate candidates' names on a ballot."

Election.com has also found SQL Server 2000's DTS to be an effective tool, says McGilvray. "We import a lot of data, either from membership files from organizations or from voter registration files," he says. "Typically, they arrive in sequential, flat-file format. We've found that DTS is very efficient in loading that data into SQL Server 2000."

Meta Group's Zachman sums up the competitive database marketplace by declaring that the industry's choices come down to DB2, Oracle and SQL Server. "I believe that, long term, SQL Server 2000 is in a great position to gain a lot of traction and market share," he says. "Windows' ability to run on many different server vendor platforms is attractive for Windows users. Unixes lock you into expensive hardware."

Nance, a software developer and consultant for 29 years, is the author of Introduction to Networking *(fourth edition), and* Client/Server LAN Programming. *You can reach him at barryn@erols.com.*

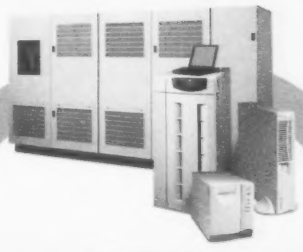
> Microsoft has server-side development tools that blow away anything other vendors have.
>
> MATTHEW DROOKER, VICE PRESIDENT, SYSTEMS DEVELOPMENT, TURNER BROADCASTING SALES

www.powerware.com

Powerware

We build a UPS like lives depend on it.

Today, everything's riding on computer data and continuous operations, with no margin for error. But the modern power grid goes down an average of eight hours a year. That's a risk you can't take. You don't have to with Powerware. We have more than 37 years of proven experience protecting mission-critical customers like major airports and airlines around the world.

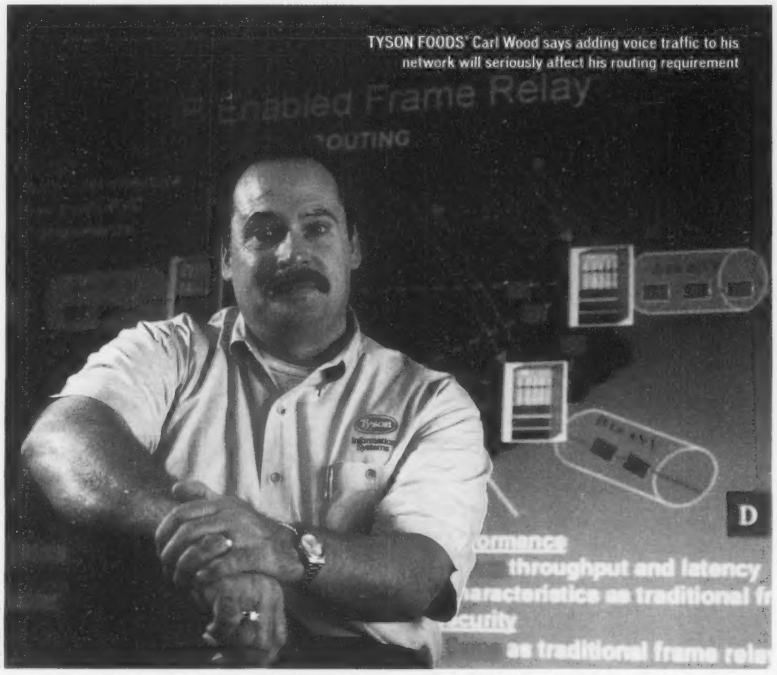


POWERWARE®
UNINTERRUPTIBLE POWER SYSTEMS

That expertise goes into our entire line of hardware, software and service. Powerware, formerly Exide Electronics, offers a full range of UPS products that protect everything from small- to mid-sized businesses to large data centers and ISPs. For more information, or to talk to our sales department, go to **www.powerware.com** or call **877-PWRWARE (877-797-9273).**

A NEW PATH FOR ROUTING?

Competitors predicted the death of the router, but experts wonder whether it makes more sense to move routing smarts to small devices. By James Cope



TYSON FOODS' Carl Wood says adding voice traffic to his network will seriously affect his routing requirement

SPENCER TIREY

Should routing be done fast and dirty, or smart and elegant?

That's the question facing many network managers, who see the convergence of voice and IP networks, increases in data traffic and new kinds of devices attached to the network as a wave threatening to engulf them. Some want to throw bandwidth at the problem, while others say building routing intelligence into other devices will spread the load and make networks more efficient.

Carl Wood, data communications manager at Tyson Foods Inc., says he hopes to add phone traffic to a network that links more than 200 remote offices to the company's headquarters in Springdale, Ark.

Wood and other experts wonder whether traditional routers and routing schema are the best way to direct new types of network traffic and to give priority to specific types of traffic such as payroll, which should have priority on certain days of the week.

Wood, for example, is considering using the IP routing capabilities built into AT&T Corp.'s frame-relay service to let the service provider handle routing of voice calls over IP. This would mean Tyson wouldn't have to handle voice-over-IP routing in its network infrastructure.

Jerald Murphy, an analyst at Meta Group Inc. in Stamford, Conn., says the debate among internetworking experts centers around whether the ever-increasing load on the routing infrastructure can be best handled by adding smarter routing technologies that can work within the confines of static and sometimes-limited bandwidth. The alternative, he says, would be to expand available bandwidth using optical connections, Gigabit Ethernet or other high-bandwidth links.

More specifically, in a situation where a T1 line running at 1.5M bit/sec. is the fastest pipe connecting sites, routers can be set to classify traffic by IP address, which could, for example, give data between points A and B on the network precedence over traffic between points D and C. However, if the connecting pipe is running over optical fiber at OC-192 speeds, or 10G bit/sec., there may not be a need to prioritize traffic, because the bandwidth is high enough that nothing has to wait.

Close to the User

One scheme to smarten the network comes from Nortel Networks Corp. in Brampton, Ontario. Nortel is promoting OpenIP, a suite of routing development software that it developed and offers to resellers.

OpenIP technology is designed to build routing savvy into any device that has an IP address, by letting it bypass routers and hop on its own from network to network.

Kalai Kalaichelvan, general manager of Nortel's OpenIP division, claims that routers are a bottleneck. He says it makes more sense to put routing intelligence into bunches of small devices that are closer to

See Routing, page 122

RAGING Knowledge

Leverage your greatest asset.

Raging Knowledge is a leading provider of collaborative, web-based knowledge management solutions for the transfer and exchange of tacit knowledge.

- Reduce reliance on (and subsequent cost of) outside services.
- Increase overall productivity through sharing of knowledge.
- Gain business insights through built-in analytical management tools.

Visit www.ragingknowledge.com or call 212-430-3870

© 2000 Raging Knowledge, Inc. All Rights Reserved.

A NEW PATH FOR ROUTING?

Continued from page 120

the user, such as cell phones and personal digital assistants, than it does to make large routers at the outer edge or at the inner core of networks responsible for directing all the traffic.

With OpenIP, according to Kalaichelvan, manufacturers can write code into a device to give it the ability to understand routing algorithms. That allows the device to receive and forward packets over the network without a router.

"It is not the router that is important; it's the routing as a function that's important," Kalaichelvan says. "We have to open this [routing functionality] and have routing intelligence in other devices."

That idea is a little far-fetched, says Charles Boyle, director of research and co-founder of Digex Inc., a managed network and application outsourcer in Beltsville, Md.

"It used to be that you could manipulate routing tables by hand by using all of your tools and service mechanisms to figure out paths," Boyle says. When you work that way, "you have to monitor your network extensively."

However, if Nortel is trying to build the equivalent of routing tables into small devices in a home office, for example, who would be responsible for troubleshooting a PC that does routing when something goes wrong? he asks. "My stereo, [for example], isn't a real good router," Boyle quips.

Tom Russell, director of marketing for high-end routing platforms at Cisco Systems Inc. in San Jose, says he agrees that devices close to the user will eventually become more IP-addressable.

Now network managers are looking for ways to increase routing control and the performance of IP networks by prioritizing traffic, adding security and engineering traffic. The latter, Russell says, refers to predetermining paths through router settings that enable a service provider to send priority traffic over its own network while routing less-critical traffic over the public Internet.

Meta Group's Murphy questions the concept of transferring routing to a variety of small devices not previously endowed with routing intelligence. He says he prefers high-bandwidth optical networks, a category in which he and other analysts say Nortel has focused and is leading.

Too much routing intelligence at the core of a network slows it down, says Alexander Muse, president and CEO of LayerOne Inc., a Dallas integrator that sets up optical network interchanges for service providers.

Muse says that because updating networks to make devices smart is expensive and time-consuming, most routing at the core of the network should be done "dumb and fast" at the optical transport layer, without regard for what types of traffic and protocols are traveling on the wavelengths of light. That leaves it to routers to determine classes of traffic at the network edge.

No one who thinks seriously about high-performance network architectures is happy about putting more intelligence at the core, says Tim Lance, chairman and president of NyserNet Inc., a Syracuse, N.Y.-based not-for-profit internetwork that connects universities and researchers throughout New York. Lance predicts that more intelligence, including routing, will show up at the borders of the network, partially because the applications on the network will have widely varied requirements

What Works?

Tyson's Wood says he's more interested in what works and conserves money and resources than he is in vendor strategies.

Wood says the hub-and-spoke wide-area network works well enough for data that flows between corporate and branch operations. But adding telephone calls over Tyson's network using voice over IP may strain its existing architecture. It would mean calls made from one regional office to another would have to come through routers to Tyson's headquarters, and then go back out through the network to their destination. That, he says, could force him to expand Tyson's core network infrastructure, which means additional capital expenses and increases in ongoing maintenance costs.

Wood says he could avoid those headaches by piping the IP traffic over AT&T's frame-relay network — essentially avoiding the question of how to revamp his routing network by letting the carrier handle it.

The idea of sending IP data packets over frame from one point to another isn't new, but Tim Halpin, product manager for frame and Asynchronous Transfer Mode services at AT&T, says adding IP routing capabilities that facilitate delivery among many locations is.

"Now, instead of just getting packets from one point to another, it's like the network becomes one big router," Wood says.

Diminishing the role of the router by increasing bandwidth or by adding routing intelligence to more devices would no doubt be disconcerting to leading vendors like Cisco, which has the lion's share of the market, according to Jim Slaby, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Although Cisco professes support of open routing standards, Slaby says, "Cisco has really built a bunch of proprietary extensions to existing standards that tend to work only with Cisco products."

Cisco employs a "hybridized" routing scheme, according to experts. The company's scheme combines distance-vector routing and link-state routing. In distance-vector routing, routers regularly send copies of their routing tables to other routers nearby. Link-state routing uses algorithms that help a router compute the best path to a destination on a network.

Among other things, this lessens the need to update sessions, such as a database query or an e-commerce transaction, and gives more bandwidth to applications and less to the routing process itself.

Ultimately, the question of whether colossal bandwidth will obviate smarter routing may become a moot point. As users run more services over internetworks and longer distances, there will no doubt be a need for networks that have speed, capacity and a sense of direction.

"It's not the router that is important; it's the routing as a function that's important."

KALAI KALAICHELVAN, GENERAL MANAGER, OPENIP DIVISION, NORTEL NETWORKS

Winsurf Mainframe Access

The Complete Web-To-Host Connectivity Tool.

IBM 390, AS400, DEC/UNIX, Bull Access

Auto Deployment

Rejuvenation Tools

Automatic HTML Conversion

SSL/TLS Security HTTPS

Usage Metering
Concurrent User Pricing

"WMA, at present, is the most inclusive, best rounded 'all-in-one' Web-to-host offering on the market."
© ***Anura Gurugé**, August 2000*

www.icominfo.com/cw

ICOM INFORMATICS

Contact ICOM Informatics today for a free eval copy of the most complete web-to-host offering on the market.

FRANCE	DEUTSCHLAND	UNITED KINGDOM	USA
ICOM Informatique	**ICOM Informatics**	**ICOM Informatics**	**ICOM Informatics**
18, avenue Winston Churchill	Stefan-George-Ring 29	Exchange House, 494 Midsummer Bld.	11824 Jollyville Road - Suite 500
F-94227 Charenton Cedex	D-81929 München	Central Milton Keynes MK9 2EA	Austin, TX 78759
Tel.: 33 (0) 1 46 76 45 50	Tel.: 49 (0) 89 930 861 50	Tel.: 44 (0) 1908 677616	Tel.: 1 512 335 8200
Fax: 33 (0) 1 46 76 45 59	Fax: 49 (0) 89 930 5184	Fax: 44 (0) 1908 670013	Fax: 1 512 335 9110
http://www.icominfo.fr	http://www.icominfo.com	http://www.icominfo.com	http://www.icominfo.com/cw

Applets and Servlets

BY JON UDELL

DEFINITION

Applets are Java programs that download into a browser, then run inside the browser's window. They can be used to create advanced, highly interactive graphical user interfaces that plain or dynamic HTML can't render. **Servlets** are Java programs that run inside a Java-based Web server or Java application server. Like Common Gateway Interface programs, servlets can deliver Web services directly to the browser or act as middleware that connects the browser to back-end services.

When Java burst on the scene, applets were the stars of the show. It was already clear that the HTML browser was a wonderfully universal application platform, although not a very rich one. Applets promised the best of both worlds: the zero-install, "write-once, run anywhere" qualities of pure HTML and the richness of the native graphical user interface (GUI).

So far, that vision hasn't panned out. A recent survey pegged the use of Java applets on the Web's 500 most-trafficked sites at less than 2%. Why? Some developers fault the overhead of interpreting bytecode in the Java virtual machine (JVM). Others blame the "security sandbox" that prevents Java from fully exploiting local and remote services. Still others cite differences among the major browsers' JVMs. Whatever the reason, after half a decade, applets have failed to deliver on their promise to supplant HTML-based Web applications with equally portable and mobile but functionally superior GUI Web applications.

Nonetheless, although applets may not have lived up to the early hype, they do lots of useful things. Here are just a few notable examples:

■ **AnywareOffice** from VistaSource Inc. in Westboro, Mass. (*www.anywareoffice.com*). VistaSource uses a Java applet to deliver Applixware, its popular Linux office suite, into Java-enabled browsers. When an application service provider hosts AnywareOffice, the applications (such as a word processor) run on the server, but they display in an applet.

It's analogous to the Citrix Systems Inc./Microsoft Terminal Server model, but you don't need to install a special client. You can simply load the applet that displays your remote office applications into any browser that you're running.

■ **QuestAgent** from JObjects Inc. in Las Vegas (*www.jobjects.com/products/questagent/index.html*). This applet is a cross-platform search engine often included in HTML-based CD-ROM publications. A browser can display the content of such a publication but can't search its index. QuestAgent delivers portable searching and eliminates the need to create and deploy a native search engine.

■ **MindTerm** from Mindbright Technologies AB in Stockholm (*www.mindbright.com/english/technology/products/mindterm/index.html*). Suppose you're away from the office, without your laptop, and you need to transfer a file to your home server. MindTerm, a Java-based implementation of Secure Shell (SSH), enables you to transform any Java-capable browser into an SSH client that you can use to encrypt file-transfer sessions.

The Rise of Servlets

While client-side Java was failing to thrive as expected, another use of Java — on the server side — was quietly building momentum. Today, Java application servers power a large and growing number of Web-based services. And their lingua franca is the servlet application programming interface (API), which defines how a Java servlet interacts with its Java-based host. It's widely supported, and although Enterprise JavaBeans is now emerging as a standard, the much simpler servlet API creates a useful common denominator for server-side Java components.

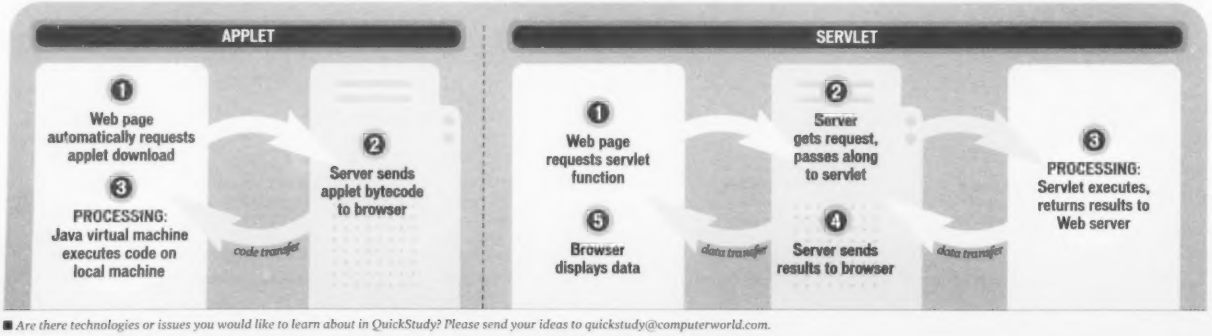
Because they're written in Java, servlets make an excellent platform for network services. Java programmers don't manage memory directly, so servlets avoid the buffer-overrun errors that create security vulnerabilities in software written in C or C++. Java's simple mechanisms for exception handling and multithreading encourage the development of reliable and responsive network services.

Servlets also have an architectural advantage that enables them to fully exploit the intrinsic benefits of Java. If an applet sent over the wire lands in an incompatible JVM, it's likely that it won't function properly, if at all. A servlet is deployed in a much more controlled environment. Because the JVM is a known quantity, there are no compatibility problems. What's more, the environment that surrounds that JVM can enhance the servlet's performance. Some Java application servers can compile servlets to native code, boosting execution speed dramatically. Others run multiple JVMs in parallel, sometimes across multiple processes in the host operating system. These strategies enhance the service's scalability and fault tolerance.

Because servlets are simple and effective, other technologies use them as building blocks. Consider Java Server Pages (JSP), a templating system that injects Java logic into HTML pages, as with Microsoft Corp.'s Active Server Pages. The first time a JSP host receives a request for a JSP page, it compiles the Java logic and HTML content into a servlet. Thereafter, requests for the page are answered by the servlet.

Java applets may yet fulfill their original promise. Demand for a richer Web GUI is growing, and no other technology on the horizon offers Java's cross-platform, cross-browser portability. Meanwhile, however, Java servlets are an unqualified success. ◗

Udell is the author of Practical Internet Groupware. *Contact him at udell@monad.net.*



■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

e.commerce parking

All your servers backed up in a preposterously small amount of space. Lots of drives, huge capacities and connectivity to everything you own. And the new Spectra 64000 is just one of the many rackmountable tape libraries we offer. But no matter which one you choose, you'll always get the most terabytes in the fewest U's on the planet. Park lots. Go get more. There's plenty of room. For the skinny on any of our products, call toll-free 1-866-249-9966 or visit www.spectralogic.com/small-is-big.

SPECTRA LOGIC

THE GAME IS ALWAYS: SMALLER/FASTER/MORE

©2000 Spectra Logic, Inc. 1700 N. 55th Street, Boulder, Colorado 80301 USA 303-449-6400 www.spectralogic.com

Help wanted:
3,500 high-tech jobs

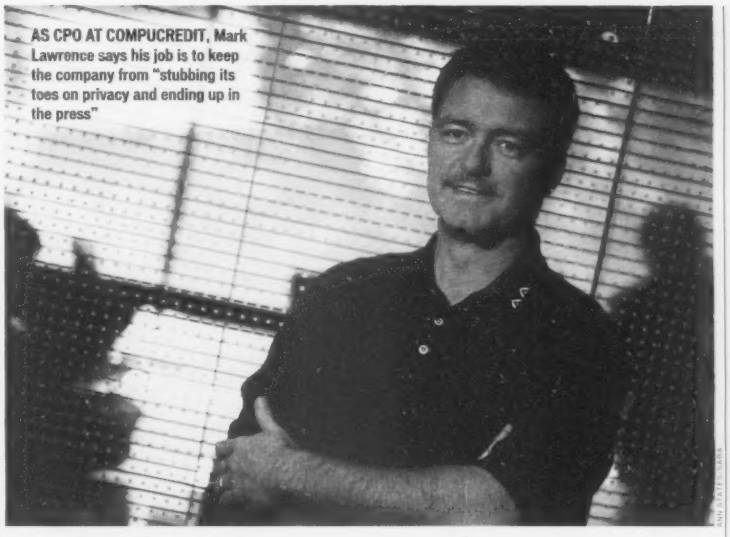
The tech industry moves fast. And so do we.

Nwjobspace.com is your direct link to the hottest high-tech jobs in the Puget Sound region — with hundreds of new tech jobs posted daily from The Seattle Times and Seattle Post-Intelligencer newspapers and more than 100 featured Northwest employers.

Our region is a mecca for tech industries —and no one knows it better than we do. Nwjobspace.com is local, knowledgeable and the only job search site you'll need.

nwjobspace.com

A Service of The Seattle Times Company



AS CPO AT COMPUCREDIT, Mark Lawrence says his job is to keep the company from "stubbing its toes on privacy and ending up in the press"

Keeping Secrets

Today, few professionals hold the title of chief privacy officer, and many who do come from legal backgrounds. But that's changing in the wake of new privacy regulations that impact how a company handles and stores sensitive data. By Deborah Radcliff

PERHAPS IT'S ONE OF information technology's best kept career secrets, since today, only approximately 75 people fill the position of chief privacy officer (CPO).

But that number should jump a hundredfold next year. Medical and financial companies will be scrambling to comply with two new consumer-data privacy acts that were passed last year.

The CPO is definitely a job whose time has come, according to Alan Westin, a professor of public law and government at Columbia University in New York, and president of Privacy and American Business, a privacy research and professional services group in Hackensack, N.J.

Many CPOs hail from legal and consumer-affairs backgrounds, such as Kirk Herath at Nationwide, an insurance company in Columbus, Ohio, with $115 billion in financial assets. But because these new regulatory issues translate into technology initiatives such as customer relationship management (CRM), help desks and information audits, CPOs also get recruited from IT.

This latter path is the one taken by Mark Lawrence, IT director at CompuCredit Corp. in Atlanta, where he became the $150 million credit-card company's first CPO in June. In his new role, Lawrence's chief directive is to keep CompuCredit from "stubbing its toes on privacy and ending up in the press," he says. His first order of action: education.

Currently, Lawrence is putting the finishing touches on a privacy code — an easy-to-understand set of employee guidelines that the company's 300 employees will be required to read and sign.

"The biggest challenge right now is education of the entire workforce. Being that we're a credit-card operation, we have everyone from executives to marketing to customer service and collection agents handling customer data," explains Lawrence. "Everyone needs to know our position on privacy, how they fit into that picture and what their responsibilities are to protect customer information."

JUST THE FACTS

Who: Mark Lawrence

Company: CompuCredit Corp., Atlanta

Title: Chief privacy officer/director of information technology

Previous Title: Director of IT

Reports to: Chief operating officer

Lawrence must also interpret the jargon-filled Gramm-Leach-Bliley Act that was passed last year to protect consumer data in the financial industry, while keeping up with privacy laws state by state and overseeing the technical initiatives required to support compliance. The task is one that "no amount of caffeine" makes any easier, he says. Some of these IT initiatives include the following:

- Building a channel to send compliance notices to CompuCredit's 1.8 million cardholders, possibly with monthly statements.
- Beefing up the company's automated voice response and CRM systems for an expected onslaught of customer inquiries once the notices are sent out.
- Creating a channel to support thousands of customer requests for access to their data, as noted in the compliance letters.
- Tying application developments and system changes into a privacy review process.
- Revamping system auditing processes to include data privacy audits.

In addition to oversight of these initiatives, Lawrence is also learning how to diplomatically say, "No way," like he did recently when the marketing department said it wanted to send customer information to one of CompuCredit's vendors.

"You need the ability to work with other business units inside the company, each of which has their own agendas," Lawrence says. "You need to understand that marketing, as it should be, is driven to bring new products to market quickly. That means taking two very different agendas and making them work together."

Because the legal issues are so challenging, Lawrence says he'd never recommend that an IT leader take this job unless that person had access to strong, in-house legal counsel. That's why most companies hire their CPOs out of the legal/regulatory departments. But then those legal eagles have the disadvantage of not knowing technology.

Take Nationwide, for example. With 35,000 employees worldwide, Herath faces a daunting challenge, not the least of which is employee training — a challenge that's 1,000 times bigger than that of CompuCredit. He must also devise a mechanism for dispensing federally required privacy and recourse information to 14 million customers worldwide.

"The implications of the new privacy regulations are huge, mind-boggling," Herath says. "We're in an information age, and our work in insurance is predicated on all types of information from all types of sources.

"We're looking at Web-based technology to streamline training to at least 98% of our employees. And we're trying to lay in the procedures, like Web-based Q&As and more help desk personnel, to handle at minimum a 1% increase in inquiries from customers asking for access to their records," Herath says.

Even with their disparate backgrounds, Herath and Lawrence share a few traits. One of those is knowing who to call for advice. Both also report to high-level executives and board members, whose support is key to any CPO's effectiveness, according to Westin. And both have been too busy with their positions to consider what, if any, their next career moves might be.

Can CPOs be forces? Or are they figureheads? See page 62.

The right stuff.
The right place.

When opportunity meets talent, amazing things can happen. Just ask Michael Nolan from NCR's Waterloo, Canada office. "The people

Passionate About Making A Difference.

at NCR, and the company, drive me to try and make a difference every day. This is by far the most rewarding company I've ever been associated with." It's just this sort of passion for making a difference, for getting things right, that makes us different. But then, NCR has always been about finding solutions. Innovations. "NCR is propelling me into the future," says Michael. The countdown has already started.

COMPUTERWORLD 100 BEST PLACES TO WORK IN IT 2000

www.ncr.com

An Equal Opportunity Employer, M/F/D/V

DO YOU KNOW
DO YOU KNOW
DO YOU KNOW

NCR

Talent is the fuel of the new economy.

Fill up with ITcareers.

ITcareers and ITcareers.com can put your message in front of 2/3 of all US IT professionals. If you want to make hires, make your way into our pages.

Call Janis Crowley at 1-800-762-2977

PROGRAMMER ANALYSTS needed to design, analyze and program mainframe databases and related systems using Assembler, DB2 and COBOL on mainframe and VAX/VMS platforms. Three years of experience are required. Must be willing to relocate to various unanticipated work sites throughout the U.S. every 4 to 10 months. Must have proof of legal authority to work in the U.S.

Salary: $80,000.00/year for a 40 hour work week.

Apply at the Texas Workforce Commission, Allen, TX, or send resume to the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, TX 78701. JO#TX1027525. Ad paid by an Equal Opportunity Employer.

Software Engineer needed to develop new printer systems and maintain obsolete drives for PosterShop to run on Win32 Operating Systems. The position requires a B.S. Degree in Computer Science or related field. Requires demonstrable knowledge of Win32 Operating Systems including I/O, process and memory management, file system and security. Requires demonstrable ability to use networking protocol such as TCP/IP and SNMP. Also demonstrable knowledge of database models and languages including, SQL and ability to design a bug free database solution for software problems using C++. Requires demonstrable ability to program using both low-level and high-level API. The position is full-time, 40 hours per week. Salary $46,000 per year. Applicants to send resume to: Attn: Ms. Pat Redington, Job Order No: 3061102, DEPARTMENT OF WORKFORCE SERVICES, 140 East 300 South, Fifth Floor, Salt Lake City, Utah 84111.

SOFTWARE ENGINEERS needed for design and development of Internet applications using Visual C++, Visual Java and Microsoft's COM (Common Object Model) technology. Masters required in Math, Computers, Engineering or any other related field of study, plus one yr. exp. Must have proof of legal authority to work in the U.S.

Salary: $57,000.00/yr. for a 40 hr. work week.

Interested applicants send resume to the Oklahoma State Employment Service, 11654-A East 21st St., Tulsa, OK 74129 (I.D.#7209); ph#(918) 437-4473. Refer to Job Order #435135. Ad paid by An Equal Opportunity Employer.

Call your ITcareers Sales Representative or Janis Crowley 1-800-762-2977

SOFTWARE ENGINEER

Analyze, design, dvlp, code, test & implement commercial apps, using in-depth knowledge of system dvlpmt life cycle. Dvlp designs based on specs. Analyze, evaluate & modify existing/proposed systems. Coordinate w/ users to ensure efficient & timely delivery of systems. M.S. in Comp. Sci., Comp. Eng., Elec. Eng., Busin. or Math. (B.S. in one of the above disciplines plus 5 yrs. of progressively resp. exp. in job offered or as a Programmer Analyst, Systems Analyst or Software Consultant will be accepted in lieu of M.S. degree). Must have working knowledge of Oracle, PL/SQL, SQL, Developer 2000, Access and VB. High mobility preferred. 40 hrs/wk, 8 a.m. – 5 p.m., $66,000/yr. Qualified applicants report/submit resume to: Anthony Gebicki, Mgr, Westmoreland, Co. CareerLink, 300 East Hillis St., Youngwood, PA 15697-1808. Refer to Job Order No. WEB133540.

SOFTWARE ENGINEER

Analyze, design, dvlp, code, test & implement commercial apps, using in-depth knowledge of system dvlpmt life cycle. Dvlp designs based on specs. Analyze, evaluate & modify existing/proposed systems. Coordinate w/ users to ensure efficient & timely delivery of systems. M.S. in Comp. Sci., Comp. Eng., Elec. Eng., Busin. or Math. (B.S. in one of the above disciplines plus 5 yrs. of progressively resp. exp. in job offered or as a Programmer Analyst, Systems Analyst or Software Consultant will be accepted in lieu of M.S. degree). Must have working knowledge of Java, HTML, C, UNIX and VAX. High mobility preferred. 40 hrs/wk, 8 a.m. – 5 p.m., $63,000/yr. Qualified applicants report/submit resume to: Sue Nolarnicola, Sprvsr, Fayette Co. Team PA CareerLink, 32 Iowa St., Uniontown, PA 15401-3513. Refer to Job Order No. WEB133537.

Epoch Technical Services, Inc., has immediate multiple openings for exp'ed IT professionals in the following areas (various skills combination reqd.) JavaScript, Jaguar, PowerDynamo, WinNT, Unix Server, Informix, MFG/PRO, SQL Server, Sybase, FoxPro, Progress, Oracle, ObjectCycle, PowerBuilder, Btrieve. Some positions require MS or equiv. CS, Engg, Math, Bus. Admin, or rel. field while others require BS or equiv. as above. Pay commensurate with exp. Foreign equiv of educ. and/or combination of educ/exp. will be accepted. Travel/relocation reqd. Resumes & salary expectations to HR, 291 Heron Avenue, Naples, FL 34108.

IT professionals with a min. of 2 yrs industry experience in ES/9000, CL/400, SQL/400, SDA, RLU, SUBFILES, ISPF/PDF, QMF, T-SQL needed. Travel reqd. Please send resume & salary reqmnts. to HR, 4701 MacCorkle Avenue, SE, Charleston, WV 25304.

Infosys International, a Plainview, NY based IT implementation corp. has immediate need for exp'd. IT professionals in (A) or (B). (A): Informix-Online-5.x, Advanced Informix 4GL, Informix-Online Dynamic Server 7.24UC8, Delphi, Unix SVR4; (B): Lotus Notes Domino/Domino Rel.5, Synthesis, XML, JScript, Cactus, WebFocus; Travel reqd. Please send resume & salary expectations to HR, 110 Terminal Drive, Plainview, NY 11803.

Computer Technology Consultants Opportunities are available for consultants nationwide in the following areas: Oracle, SAP, JD Edwards, Peoplesoft, object oriented technologies, & electronic commerce. Apply to Ref# 818, J. Eckert, Cap Gemini, Ernst & Young, 1280 Wall Street West, Lyndhurst, NJ 07071.

IT Nirvana.

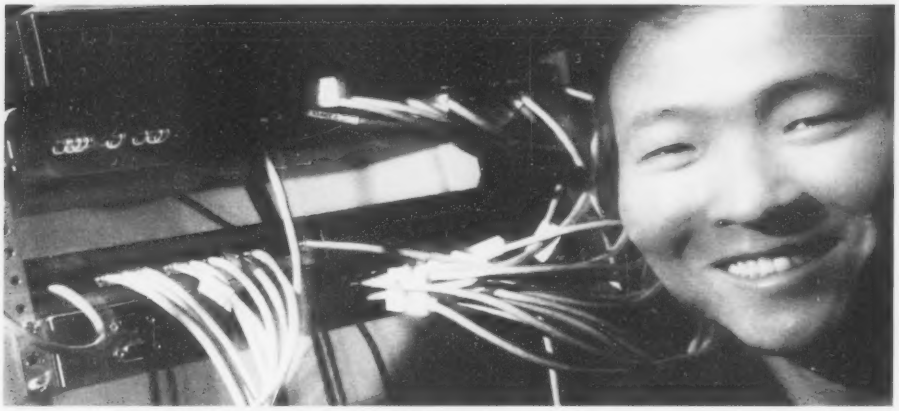
When you feel a heightened state of being filthy rich.

Live your IT Nirvana.
Find it at dice.com.

Dice.com makes your IT Nirvana come true because we focus exclusively on quality high tech jobs with only the best companies. And we offer great career tools completely free of charge. So, we make it easy to find the perfect IT job, the biggest paycheck and, if you're lucky, spiritual enlightenment. What's your IT Nirvana?

A SERVICE OF:
EARTHWEB CAREER SOLUTIONS
Nasdaq: EWBX

dice.com
High tech jobs online



You live in a big city and work on a small network. How about switching that around?

Not a bad trade-off when you consider you'll be working on one of the country's largest privately owned computer networks. It also happens to be one of *Computerworld's* "100 Best Places to Work" and ranked #15 on the Fortune 500 company list. Add to that an easy-going lifestyle, a family-friendly benefits package, a diverse workplace and you'll kick yourself for not having made the switch years ago.

Contact State Farm Human Resources at **jobopps.corpsouth@statefarm.com** for information about current positions. Or visit our website at **statefarm.com**.℠

STATE FARM INSURANCE

Get there with State Farm.

State Farm Insurance Companies • Home Offices: Bloomington, Illinois
An Equal Opportunity Employer

SURE NETWORKWORLD, COMPUTERWORLD, AND INFOWORLD HELP YOU DO A BETTER JOB. NOW LET US HELP YOU GET ONE. CALL:

1-800-762-2977

IT careers

It's Fast. It's Huge. It Crosses Worlds & Dimensions.

IT careers.com

IT careers

INFORMATION TECHNOLOGY · KAISER PERMANENTE

KAISER PERMANENTE®

Tomorrow: **a cure**
Today: **the IT infrastructure that it's founded on**

What matters most? Your family, your work. Your health. Today, everywhere you look, technology is making the difference in all these areas. At Kaiser Permanente, we're dedicated to enhancing health care delivery through state of the art information tools. And the 3,500 experts at Kaiser Permanente IT are at the heart of that mission. Getting life saving information where it needs to go. Talk about mission critical, target Kaiser IT.

Bring your expertise to Kaiser Permanente today in one of the following disciplines. Become involved in exciting initiatives such as Web development, extranet, intranet, enterprise data security solutions, network planning, client/server-based projects, network infrastructure, project management and technology planning.

Position Locations:
California, Colorado, Georgia, Hawaii, Maryland, Ohio, Oregon, and Washington D.C.

PC LAN
Seeking field technicians, administrators, desktop support specialists, LAN consultants and analysts with expertise in NT, Novell, TCP/IP, Lotus Notes, MS Exchange/Messaging, e-mail, LAN and WAN.

NETWORKING
Seeking administrators, consultants, WAN engineers, network design analysts and security consultants with expertise in UNIX®, Cisco hubs, routers, bridges, switches, Fast Ethernet, Token Ring, Frame Relay, ATM, AVR and Telephony.

TELECOMMUNICATIONS
Seeking analysts, consultants, software technical specialists and project managers with expertise in UNIX, Cisco hubs, routers, bridges, switches, voice, data, IVR, CTI, ACD, PBX, Nortel Passport, ATM, Frame Relay and Call Center.

DATABASE ADMINISTRATION
Seeking professionals with experience in a large, complex multi-vendor database environment who possess skills in any of the following: Oracle, DB2, Sybase, IMS, physical database design, DBMS utilities in UNIX or MVS environments; O-O methods preferred.

DATA ANALYSIS
Seeking professionals with experience in logical database design, data modeling/Entity-Relationship diagramming, meta-data management and ERWin/Platinum; O-O methods preferred.

DATA WAREHOUSING
Seeking professionals with experience in Oracle, Essbase, Business Objects (Sequent a plus), data warehouse design and data transformation/extraction.

APPLICATIONS DEVELOPMENT
Seeking programmer analysts, systems programmers, systems analysts, application developers, group leads and operations specialists with expertise in PowerBuilder, C++, C, Visual Basic, Sybase, Oracle, UNIX, IEF/Composer, COOL:Gen, ADS Plus, MUMPS, SAS, EDI, MQ, OBDC, OCC, Corba, COBOL, COBOL II, JCL, MVS, DB2, CICS, Model 204, IMS, MANTIS, Pega Systems, Tandem, TAL, DEC/VAX/VMS, PeopleSoft and Tesseract.

BUSINESS ANALYSIS/ PROJECT MANAGEMENT
Seeking analysts, consultants and project managers to oversee projects utilizing MS Project with expertise in planning and implementation within an IT environment.

WEB DEVELOPMENT
Seeking senior Web developers to develop Web applications using Java™, application servers, and Oracle in a UNIX environment.

SOFTWARE ENGINEERING/ SYSTEMS ARCHITECTURE
Seeking expertise in emerging technologies for enterprise systems on an O-O or UNIX platform.

LOTUS NOTES ADMINISTRATION/DEVELOPMENT
Seeking administrators with experience in large-scale Notes infrastructure. Experience with R5, Domino 4.X or higher, hands-on administration, troubleshooting, replication, mail routing, calendar and scheduling problems. Development candidates should possess strong Lotus Script and NT expertise.

TECH WRITING/INSTRUCTIONAL DESIGN
Seeking experts in Adobe Illustrator®, Microsoft Office Suite, HTML and Visio.

UNIX SYSTEM ADMINISTRATORS
Seeking UNIX System Administrators with at least 3 years of system administration experience in AIX and/or Solaris™.

Find out more about Kaiser Permanente Information Technology by visiting **www.kp.org/jobs;** click on "IT Division" tab. **Submit one resume only**, by e-mail to: **kpitjobs@kp.org**. The tangible and intangible benefits of working for an organization of our size and scope will change your career perspective in a healthy way. Affirmative Action/Equal Opportunity Employer. All trademarks belong to their respective companies.

www.kp.org/jobs

more challenge. more opportunity. more success.

get more from your career

Bring your unique skills to **VoiceStream Wireless** and experience more of the challenge, opportunity and success you crave in your career in an atmosphere that rewards individual growth and team performance. By attracting and retaining the best and brightest talent in the industry, we guarantee our customers enjoy more airtime, more features, and more valuable service than any other PCS carrier.

Combining the precise blend of technology, strategy and innovation, VoiceStream has emerged as a premier name in the telecommunications industry. Now the world's largest GSM carrier, in terms of pops, VoiceStream is well positioned for future success. Building on our existing strengths, we will continue to expand at a spectacular pace across the nation, strengthening our image in existing markets and breaking new ground in others.

We are currently seeking IT Professionals in the following areas:

- Infrastructure
- Project Management
- Systems Operations
- Customer Systems
- System Support
- Fraud

Online applications may be completed on our website for immediate consideration.

VoiceStream
Get more from life.

www.voicestream.com/jobs

VoiceStream is an equal opportunity employer.

DIRECTOR, TECHNICAL SERVICES

DIRECTV is the first entertainment service to deliver multi-channel TV programming to an 18-inch satellite dish. In our first two years, DIRECTV became the fastest selling consumer electronics product introduction in U.S. history, surpassing product launch sales of the VCR and CD player. Now with 9 million customers, we're planning our next stop on the digital frontier and with your skill and ideas, there's no limit to how far we can go.

In this critical assignment, you will direct employees engaged in technical support, including the installation, maintenance and modification of electronics equipment and LANs/WANs used in the transmission of data and signals. We'll rely on you to organize, control, plan and staff tech support activities; establish/monitor ongoing projects and techniques; direct procurement and monitoring of electronics and computer equipment, systems and services; and coordinate studies to determine current and future requirements. This opportunity demands an effective leader with an undergraduate degree and 10+ years of engineering and tech support experience. A broad grasp of administrative process, in-depth knowledge of tech support systems, equipment, procedures and techniques and a strategic understanding of broadcast operations objectives are essential. The ability to translate plans into tech support programs as well as organize and direct skilled and creative tech support technicians and professionals is also necessary.

DIRECTV offers you the opportunity to work for a high-growth company, which is delivering the future of entertainment today! Please send your resume, indicating job code 202773NB, to **DIRECTV, Inc., Attn: Human Resources, 12800 Culver Blvd., Los Angeles, CA 90066 or email (text format only, no attachments) to labc-hr@directv.com**. EOE M/F/D/V

Check out our website at
www.directv.com.

DIRECTV

THE INTERNET RECRUITING MASTERS SERIES

THE "MICHAEL JORDAN" OF IT RECRUITING IS ON YOUR BENCH.

PRESENTING DR. JOHN SULLIVAN

International Recruiting Specialist

Fast Company Magazine crowned him "the Michael Jordan of our industry." You can see why he measures up. A luminary. An expert on effective recruiting in the world's tightest job market. Now, he's on *your* bench.

This free one-hour webcast is "must see" viewing for anyone connected with IT recruiting. Managers, staffing managers, recruiters, anyone. Register today at www.ITworld.com/ITwebcast/masters.html.

IT'S FREE. IT'S 24/7. IT'S ON-DEMAND AND IT'S ONLY AT ITWORLD.COM.

Produced by: ITworld.com | In association with: THE STANDARD | Sponsored by: SkillsVillage

The Future Is Moving Faster, It's Time To Adapt.

*You have come this far in your career, now come to Adaptec in **Nashua, NH**, and help us deliver the promise of high performance RAID, Fibre Channel, SAN and future storage technologies. We have exceptional technology and we are committed to your professional development.*

We have the following prime opportunity available:

NetWare/NT/UNIX Device Driver ▲ Development Engineer

We have an opening for a Software Engineer to work in our Device Driver Group. You will be responsible for leading the design, implementation and support of NetWare based device drivers for Adaptec's Flagship RAID storage subsystem. Also work with application engineers to develop and maintain storage management applications on NetWare to support the RAID storage subsystem. You will also have opportunities to work with NT and UNIX based drivers for RAID storage subsystems, new RAID hardware systems and future storage technologies. You will have 3-5 years' experience in UNIX/NT device drivers with specific knowledge of NetWare drivers and OS internals a plus. Device driver experience on other operating systems a plus. RAID experience also a plus. BSCS/CE/EE or equivalent experience desired.

Our location in **Nashua, NH**, a small city 40 miles northwest of Boston, and our benefits, compensation, other incentives and events are geared to your lifestyle. Connect with Adaptec by e-mailing your resume, referencing ad code CW1100, to:

Attn: Human Resources
E-mail: jobsnh@adaptec.com
We are an equal opportunity employer.
M/F/D/V.

adaptec
www.adaptec.com

e-lite companies

e-merging companies

e-ssential companies

e-normous opportunities

IT careers.com
where the best get better
1-800-762-2977

PUT YOUR OWN STARS ON STAGE

Announcing The ITcareers Achievement Showcase

★

This is where advertising and retention work together.

Build retention into your IT advertising program through public recognition of your top performers. Use messages on how you value employees - as you attempt to attract new ones.

The ITcareers Showcase will have prime position within our weekly advertising section - appearing in Computerworld, InfoWorld and Network World.

These pages will honor:

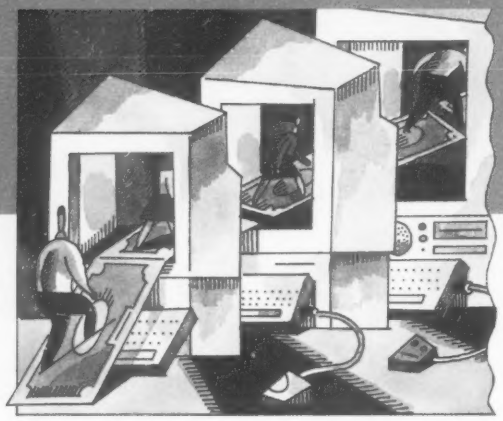
- ★ Award winners for technology or service achievements
- ★ Award winners for community service
- ★ Patent awards
- ★ Special assignments and promotions

The Achievement Showcase was created for employers who understand that your most important target market is the IT professional who already works for you.

For information on our special introductory rates, call Janis Crowley 1-800-762-2977.

IT careers

IT Careers in E-Business



Basic e-business capabilities are the price of admission for most businesses. Increasingly more traditional businesses are turning to functions as distinct as customer relationship management to data mining to provide customers with better, more personal service.

Just as real is the challenge of meeting the year-end and holiday rush. Whether in e-tail or financial services, it's a time of increased activity and expectations.

Avon Products, Inc. New York, NY

The backbone of Avon Products is a worldwide sales force of 3 million individuals. The challenge is how to use information technology to help each of these direct sales people grow and personalize their business. "Using our e-business capabilities we can help sales people grow their business, but we can also make the system more efficient for them," explains Harriet Edelman, senior vice president and chief information officer.

Unlike many e-enabled consumer businesses, Avon is a vertically integrated company. This includes research and development, manufacturing, warehousing, inventory control, merchandising and pick and pack. "These are the areas that allow the business to operate more efficiently, and the systems we're developing include customer relationship management, supply chain management, marketing/product development, decision support and human resources applications," Edelman says.

However, Avon is not developing a one-solution-fits-all strategy. Edelman says the nature of the business varies by geographic region, whether in Poland, Brazil or the United States. "Those who work in IT at Avon get exposure to different IT infrastructures and business models. It's a rich opportunity," she says.

Edelman needs hot skills – network development, telecommunications, programming and business function experience. "We may develop or offer package solutions, but because of the global nature and those varied infrastructures, there is a lot of opportunity for customization development," she says. "We need people who understand our role as a big solution provider and who have a sense of flexibility about solutions. We evaluate many choices. There isn't one Avon around the world, so we have to be flexible. We are migrating to solutions sets that are affordable and that can be customized to match the footprint of the business, whether in the Philippines or in Mexico."

Avon currently employs 1,200 IT professionals worldwide, and its current openings are primarily at the Technology Center in Rye, NY. "It's a great place to move into entirely new career areas, under one roof," says Edelman, who has worked in marketing, operations, field sales and IT. "We pride ourselves on paying attention to the details of what makes Avon a great place to work. We are a company that has built the careers of individuals, but particularly the careers of women. We have long years of history in our commitment to those who work with Avon."

BestBuy.com Eden Prairie, MN

Since its launch in June, BestBuy.com has been striving to become a highly stable e-commerce site, one that meets the needs of customers, but that also is a reliable site that can be updated on a continuous basis. "We're currently adding new product lines and are wrapping up a significant effort to ensure that we are scalable for the holidays," says Harold Knutson, vice president and CIO. "Now we're looking ahead in terms of what we need to do over the next two years."

The planning stage creates lots of opportunities for IT professionals who will be developing IT solutions to business issues. "As creative and exciting and energizing as the e-commerce environment is, eventually it boils down to engineering the specific capability," adds Knutson.

The company is aggressively hiring in an effort to change the mix of outside contractors and full-time employees. In the next six months, Knutson plans to hire approximately 50 individuals. "It's easy to say that they need to have the technical skills – distributed systems, coding, network protocol skills. But to be honest, I pursue the best athletes vs. the best position players. My view is that this environment can change dramatically over the next year or two. I need people who can contribute immediately, but who can also deal with a changing business landscape. As needs evolve, you'll grow from what you're doing today to what we'll need tomorrow – even if I can't yet tell you exactly what tomorrow is. There are people who love that kind of environment, and others who can't tolerate it."

Knutson looks at resumes, also, for demonstration of personal commitment to ongoing growth. "I'll see that not only through the variety of projects you've worked on but what you've taken on as a volunteer and through your personal life.

"You'll be joining a broad team of individuals who are creating a sense of community here that is energetic, forward-looking and eager to leverage technology on behalf of the business. Everything we do manifests itself in a business capability of some sort. Our goal is to provide you the opportunity to make clear what your interests are and where you'd like to grow, and then engage you in work that allows you to develop new skills and keep moving."

The MONY Group Syracuse, NY

In less than 12 months, The MONY Group has further established its e-business strategy, worked toward a January 2001 implementation of ERP and installed a new instracture designed for growth and more capability. It's been another year of IT at MONY – but only because IT is helping the financial services company to reach its goal of providing intimate service to more than 800,000 customers.

E.P. Rogers, vice president and CIO at MONY, says the company spent about four months looking across the corporation and its subsidiaries to determine where it wants to be five years from now in terms of e-business capability. "We examined how we wanted it to work for us and for customers and what pieces are necessary to make it happen," explains Rogers. "In all we identified 11 e-business projects, the first of which is customer relationship management. We needed this piece before we could go very far with our e-business strategy. We had to get on it quickly, learn to operate in Internet time and set 90-day plans to continuously challenge ourselves."

For a firm that boasts of some of the industry's top high performance work teams, the work has begun. Customer information files and some front-end marketing tools are in line to roll out, and Rogers and his team are selecting product solutions between now and year-end. "We see the price of admission to serving our customers as the ability to provide information 24 hours a day, seven days a week," says Rogers. "We had to offer that up right away, and now customers can determine the cash value of their variable annuities online. In 2001 we'll be offering service capability online that allows customers to move money from fund to fund and make simple account changes, such as address. These are not the reasons, though, that people will choose to do business with us. We have to meet or surpass customer expectations, and that's the direction of our e-business strategy."

Currently MONY has about 380 people working on IT projects and plans to hire an additional 10 percent in the short-term. Employees can move from project to project, taking skills gained to the ERP launch to the e-business project. "Some of the technical skills we need include HTML, Java, Visual Basic, Java Script. What's really important is that we work in high performance work teams so there is a high degree of personal accountability. We need people who work well in this type of environment and who own what they do."

Listed as Number 11 on *Computerworld's* list of "Top 100 IT companies," MONY's leaders believe the number one reason they have low turnover (just 7 percent) and high employee satisfaction is the work atmosphere. "We have great people who are selected by the teams. They are people who are committed and like working here. We commit to two weeks training per year for all employees, but in the technical skills it's actually three to four weeks and we pay for all certifications," adds Rogers. "It's a joint commitment to your career."

IT careers

For more job opportunities in E-business, turn to the pages of ITcareers.

- **If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.**
- **Produced by Carole R. Hedden**
- **Designed by Aldebaran Graphic Solutions**

Computer: SVI Retail, a leader in multi-channel software solutions for the retail industry, seeks a Software Engineer. Design & development of software using Java, OOA/OOD; as well as design, development & analysis of multi-tiered software for network computing. Must have BS in Comp. Sci, and 3 yrs exp as an OOA/OOD programmer. We offer an xlnt comp & benefits package. Respond to: HR Dept, SVI Retail, Inc., 19800 MacArthur Blvd, 12th Floor, Irvine, Ca 92612.

Talent is the fuel of the new economy.

Fill up with ITcareers.

ITcareers and ITcareers.com can put your message in front of 2/3 of all US IT professionals. If you want to make hires, make your way into our pages. Call Janis Crowley at 1-800-762-2977

ITCAREERS where the best get better

Sr. Consultant/Systems Analyst. Job location: Phoenix, AZ. Duties: Design, control & implement projects. Provide requirement analysis. Synthesize info. into written reports. Provide recommendations to mgmt. based on data analysis related to Web applications & back-end systems using MS Word, Excel, Power Point & Visio. Coordinate activities & resolve project issues. Develop & implement project mgmt forms. Assist in project structure, time estimation & cost budget preparation for projects using MS Project. Test and launch beta version of web applications. Prepare new project mgmt. forms. Design, test & implement in a multi-state production tracking system utilizing Visual Basic. Provide managerial & reporting tools to computer companies. Requires: B.S. or foreign degree equiv. in Comp./Info. Sci., Engineering or related field plus 2 yrs exp. in the job offered or 2 yrs exp. as a Consultant. Exp. which may have been obtained concurrently, must include: 1 yr. exp. using MS Word & Visio. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606

Consultant (2 positions): Design, develop & implement systems applicants for business clients using client-server technology and object-oriented methodology. Design and develop data mining techniques. Tools: Visual Basic; SQL Server; RDO; SQL; HTML. Bachelor's degree in Comp. Sci. or Management Information Systems + 1 yr. exp. in job offered or as an Information Systems Engineer req'd. ("Will accept degree in any business major with 12 credit hours in computer science or management information systems.) Prior exp must include: Visual Basic; SQL; HTML. 40 hrs/wk, 9am-5pm, $63,000/yr. Send resume to Colorado Dept. of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Ste 400, 1515 Arapahoe St., Denver, CO 80202-2117. RE: Job order #CO4680658.

Fulltime Corisultant resporisible for design and operation of digital cellular systems. Carry out design and modeling of the cellular networks, including radio coverage, predictions, capacity and demographic analysis, morphological, studies and databases acquisition, market analysis, specification of features and services, signaling and interface requirements, and testing methodology. Assist manufacturers and operator in the preparation and submission of license applications and equipment tenders. Conduct prototype testing and field trials. Develop conversion protocols to allow integration of European Cellular systems with US cellular systems. Must have a Bachelor's Degree in Electronics and communication engineering or foreign degree equivalent. Must have two years of experience of the job offered or in position with same duties. Salary $74,582/yr. Send resume to Chip Anderson, Logica Radio Planning, Inc. 3535 Travis Street, Suite 100, Dallas, TX 75204.

American Information Technology Corporation has openings for Software Engineers for job locations in Iowa, New Jersey, or elsewhere, with at least two years of experience in the position or as an Analyst Programmer, or Programmer. Job Duties: Research, analyze, design, develop, test and implement software applications using skills such as Cobol, DB2, CICS, JCL, Oracle and PL/SQL on ES9000 Mainframe platform. Positions require a Masters degree or the equivalent in education and experience. Excellent pay and Benefits. Mail resume to: HR Department, American Information Technology Corporation, 118 Third Avenue SE, Suite 630, Cedar Rapids, Iowa 52401.

Manager. Job location: Cincinnati, OH. Duties: Manage activities related to development of ORACLE Practice, including sales & marketing, delivery of services, recruit & mentor employees and knowledge attainment/mgmt. Manage consultants & client personnel assigned to project, potentially serve as subject-matter expert or perform analysis & design tasks, write articles, make presentations & prepare sales proposals. Develop & implement solutions based on the Oracle applications & technology stack with specific reference to Oracle Advanced Planning & Scheduling, Oracle Developer tools, Oracle Developer 2000 & Oracle Workflow. Requires: M.S. in Engineering, Comp. Sci. or Math plus 1 yr. exp. in the job offered or 1 yr. exp. as a Consultant/Engagement Mgr. Exp. which may have been obtained concurrently, must include: 1 yr. exp. using Oracle Developer 2000 & Oracle Workflow. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606.

Software Engineer/ Consultant (Denver, CO): Research, analyze, design, and develop computer software systems and web based applications for communications clients utilizing object-oriented methodologies, analyze software requirements to determine feasibility of design; consult with clients to define need or problem; analyze requirements and data to advise on and recommend solutions.

Master's degree in Engineering or Computer Science required. Two years experience in the position or two years experience with developing web based applications using object-oriented methodologies.

40 hrs./wk.; 8:00 a.m. - 5:00 p.m.; $75,000/yr.

Send resume to: Colorado Department of Labor and Employment, Employment Programs, Job Order #CO4681217 Attn: Jim Shimada, Two Park Central, Ste. 400, 1515 Arapahoe St, Denver, CO 80202-2117. NO CALLS. AN EMPLOYER PAID AD.

Senior Software Engineer sought by company in Boulder, CO specializing in integrated solutions for healthcare to work in Boulder & other unanticipated job sites in the US. Engage in full life-cycle software development. Specifically, design & develop software applications that incorporate client/server technology &/or are web-based. The software projects involve MAGIC post-4 generation language development environment & interface with Microsoft SQL & Oracle databases. Analyze requirements. Create designs & design documentation. Code, test, & debug the software applications & engage in code review. Use a number of tools & languages, including MAGIC & C++ programming languages. Engage in project management as needed. Requires a Master's degree or equivalent-specifically requires a Master's degree or foreign equivalent in Computer Science, Computer Applications, or a related field, plus three years of progressively more responsible software development experience; or, a Bachelor's degree or foreign equivalent in Computer Science, Computer Applications, or a related field, plus five years of progressively more responsible software development experience. Working knowledge of MAGIC development environment. 8am-5pm, M-F; $78,100/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO 4682225.

WE DO A BETTER JOB AT HELPING YOU GET ONE.

IT careers.com

Industrial Designer II. Originate & dvlp visual, functional & ergonomic dsgn of appliances; dvlp for eval visual dsgns of products incl graphic layouts for products & packaging; create color, graphic & 3 dimensional dsgn layouts for products & pckg applics; monitor process of product dvlpmt & resolve any dsgn issues; review all appearance-related first piece samples for production approval & provide quality control, purchasing & vendors w/color standards. Masters in Industrial Dsgn from an IDSA-accredited institute plus 3 yrs exp in job offd or in related occupation such as Industrial Dsgnr or Industrial Dsgn Consultant. 3 yrs exp in dvlpg product solutions from concept through production stages in multi-disciplinary team envrmt; & using standard 2D dsgn tools (Freehand, Photoshop, Vellum, Illustrator) & 3-D CAD tools. 1 yr exp in project mgmt. Exp w/or knowledge of diverse mfg processes & materials. Demonstrated ability in concept creation & sketching (portfolio reqd), & communication & presentation skills. 40 hrs/wk, $42,012/yr. Must have proof of legal auth to work in US. Send resume to Iowa Workforce Center, 800 7th St, SE, PO Box 729, Cedar Rapids, Iowa 52406-0729. Please refer to JO IA1101155. Employer paid ad.

Programmer/Analyst: Designs, develops, implements, and enhances UNIX/DB2 system which will be used for multiple business purposes using CICS, JCL, and XPEDITER. Enhances, modifies, and develops appropriate data modules which will be used for appropriate data acquisition and access depending upon end user requirements. Insures integration of such modules and databases in a client/server environment. Performs appropriate Internet and Intranet database implementation procedures using JAVA, JAVA SCRIPT, HTML, and PERL. Requires Bachelor's degree in Computer Science, Mathematics, or any engineering field. Also requires two years experience in the job to be performed or in lieu of two years direct experience, will accept any combination of two years experience as Programmer/Analyst, Programmer, or Consultant, if experience includes performance of duties as specified in the job offered. $60,000/year. 40 hrs. week, 8:00 a.m.-5:00 p.m. Two copies of resume to: MIKE BROOKS; DWE-ALC; P.O. Box 7972, Madison, WI 53707-7972. Reference file #C101755.

Mortgage banking company requires an Application Developer. Hours of employment are from 8:00 a.m. to 5:00 p.m. Salary is $18.27 per hour. Perform system analysis, design and programming for assigned projects, develop programs within project schedule and parameters; communicate directly with customers, users and management as to project status; develop training manuals and documentation for user training and on-going support; and train users on the use of designed programs and computer systems. Position requires a two year associate degree in Computer Science and the knowledge of at least two programming languages. Apply with letter and resume to Indiana Department of Workforce Development, 10 North Senate Avenue, Indianapolis, Indiana 46204-2277. Attention: DPG I.D.#8095826.

Computer Information Systems

PULTE Master Builder

Pulte Corporation is a Fortune 500 company seeking qualified candidates to join our talented team of professionals. Come join a company with 40+ years of profitability and growth.

We are currently interviewing in the following areas:

Database Administration – Physical/Logical

- 6 years plus overall experience with a minimum of five years in physical database system design, and implementation of Oracle databases.
- Well versed in data modeling techniques, LAN/WAN environments, SQL product knowledge of Oracle 7 x or 8 x on UNIX platform(s).
- Experience with database implementations on UNIX platforms in 24 x 7 operation.
- Undergraduate Degree.

Programmer Analyst

- Experience in Lawson Financial required.
- COBOL Programming skills with strong financial background.
- Familiar with FRx SQL, Unysis NMS and AIC.
- Undergraduate Degree.

Business Systems Analyst

- 3 - 10 years experience in hands-on project management and operations management.
- 3 - 6 years previous Business Consulting experience in applying technology solutions to business issues.
- Must have good business experience with requirements gathering, functional design and analyzing business processes.
- Undergraduate Degree MBA preferred.

Pulte Corporation offers a competitive compensation benefits package and a progressive work setting. If you are ready for a career in a challenging environment where you can make a difference, please send your resume:

PULTE CORPORATION
Attn: IS Recruiter
165 Kirts Blvd., Suite 500
Troy, MI 48084-5210
OR
fax: – 248-273-2703
E-Mail - resumes@pulte.com
No phone calls, please
Visit our web site at: *www.pulte.com*

Equal Opportunity Employer

Programmer/Analyst. Dvlp, write, code & maintain s/ware prgms using RPG (III, 400, ILE) & CL prgmg langs on AS/400 IBM comp systems; analyze & dsgn s/ware prgms & applics; implmt, test & debug prgms & applics, provide tech support to end users. BS in Comp Sci, Engg or rel field +5 yrs post-undergrad exp in job offd or in rel occupation such as Systems Analyst, RPG Prgmr or similar duties under different job title. 5 yrs exp using RPG (III, 400, or ILE) and CL prog lang on Systm 38 or AS/400 systm. Exp must incl prgmg order entry, sales, distribution (logistics), finance or mfg bus applics; working w/ integrated s/ware pkgs. 40 hrs/wk. $58K/yr. Must have proof of legal auth to work in the US. Send your resume to Iowa Workforce Center, 215 Watson Powell Jr. Way, Des Moines, Iowa 50309-1727. Please refer to JO IA1101154. Employer paid advertisement.

INFORMATION SYSTEMS MANAGER
BEMIS PAPER PACKAGING

We have an immediate opening in our Division Offices located in Terre Haute, IN for an experienced Information Systems Manager.

Position Responsibilities: Managing information systems projects and Computer Programming personnel, including custom software, software application packages, as well as interfaces to other information systems both internal and external. Special responsibilities include: Implementing package or custom information systems; creating and maintaining the operational support and programming documentation for implemented systems; managing, support and help desk functions. Oversees the development of customized information systems, interfaces and reporting. Ensures that the established development and the operational procedures are being followed.

Requirements: MBA + BS in EE, MIS, CS, as determined by a written evaluation. Qual. Card. Must also have three years of experience in MIS Software Implementation.

Qualified candidates submit resumes to:

Anne Dean, Recruiter
BEMIS COMPANY, INC.
P.O. Box 905
Terre Haute, IN 47808

Bemis Company is an equal opportunity employer.

Programmer. Sr. Development Engineer to work on distributed computing & mainframe environments. N-tier web based application development, technical support to user community. Skills & drive to be lead contributor to product development Team. Willing to multitask in fast paced, dynamic environment, object oriented development. Req: BS w/2 - 3 yrs. exp. using Java, SQL & SUN certification for JAVA. Annual Salary: $80K, 40+ hrs/wk. Work location: Cupertino, CA. Send resume: ISpring, Job # 2001, HR Dept., 21060 Homestead Road, #180, Cupertino, CA 95014. Email: jobs@ispring.com. No phone calls please.

Senior Software Engineer sought by company in Littleton, CO specializing in home satellite design & manufacturing to work in Littleton & other unanticipated job sites in the US. At a senior level, engage in full life cycle software development. Specifically, design, develop, test & modify software applications that are customized applications for research & development & software & system development. The software applications incorporate client/server architecture & ORACLE Relational Database Management Systems & run on UNIX & Windows NT operating systems. Analyze requirements; create designs & design documentation; code, test, & debug the new software applications. Customize & enhance ORACLE applications, deploy appropriate software solutions & interfaces between custom applications & ORACLE Financials/Manufacturing modules. Use programming languages C, Pro*C, & PL/SQL, & a variety of tools including Developer 2000. Requires a Master's degree or equivalent-specifically, it requires a Master's degree (or foreign equivalent) in computer science or engineering (including electronics & communications engineering), plus three years of progressive experience in developing full life cycle ORACLE software applications in a client/server environment; or a Bachelor's degree (or foreign equivalent) in computer science or engineering (including electronics & communications engineering), plus five years of progressive experience in developing full life cycle ORACLE software applications in a client/server environment. 8am-5pm, M-F; $70,350/yr. (2 openings.) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO4682376.

Enter a whole new world of opportunity.

Put your career on a fast climb and help us continue to set the industry standard in information technology.

- **UNIX - C, C++, Administration, Engineering, Informix DBAs**
- **NT Workstation - VB, VC++, Java**
- **IBM Mainframe - COBOL, CICS, DB2 & IMS DBAs**
- **Networking - Ethernet, VSAT, Frame Relay, ATM**
- **Telecommunications**

Ready to do it all? Interested candidates should forward a resume to:

Wal-Mart Information Systems Division; Attention: Recruiting Department ITC; 702 S.W. 8th Street; Bentonville, AR 72716-9050; Fax: 501-273-6879; E-mail: mawinbe@wal-mart.com. For more information, call toll-free: 1-888-JOBS-ISD or check out our career page at: www.walmartstores.com

Always

WAL★MART

EOE M/F/D/V

---

hp, one of the "Most Admired Companies in America" according to Fortune Magazine's latest ranking of U.S. - based companies, is a global leader in everything from computer systems and solutions, to test and measurement systems. We have opportunities available in Fort Collins, Greeley and Loveland, Colorado in the following positions:

- Communications Manager
- Hardware Design Engineer
- Software Design Engineer
- Product Marketing Engineer/Product Manager
- Member of IT Technical Staff
- Information Technology Specialist

hp offers competitive compensation and excellent benefits, including profit sharing, stock purchases, 401K and a retirement plan. We invite you to e-mail your resume indicating Ad #8324 to: resume@hp.com (Subject Line: Ad #8324), or send/fax it to Hewlett-Packard Employment Response Center, Attn: Ad #8324, 3000 Hanover Street, MS20AZ, Palo Alto, CA 94304-1181. FAX: (650) 813-3860. Please be sure to include Ad #8324 on your resume.

hp is an equal opportunity employer dedicated to affirmative action and work force diversity.

hp
invent

Sr. Software Engineer sought by software consulting & development company in Boulder, CO, to engage in full life cycle software development. Specifically, at a senior level, develop custom software applications that are service-level agreements. The custom software applications incorporate client/server architecture and Oracle relational database management systems. The applications run on UNIX & Windows NT operating systems &/or are web-based applications. Analyze requirements, monitor network, & retrieve & analyze data as necessary. Create designs. Code, test, debug, & modify software applications. Use Java programming language in developing software applications. Use Fire Hunter monitoring tool as needed in the development process. Engage in project management as required. Requires Master's or equivalent in Computer Science, Engineering, or related field (including Civil or Water Resources Engineering). Specifically, this position requires a Master's, or foreign degree equivalent, plus 3 yrs of progressive software development experience, or a Bachelor's, or foreign degree equivalent, plus 5 yrs of progressive software development experience. Working knowledge of Java, developing web-based applications & Fire Hunter monitoring tool. $70,000/yr; M-F, 8am-5pm. (5 openings) Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202, & refer to Job Order No. CO4682222.

---

careers.com where the best get better 1-800-762-2977

Database Administrator/ Analyst: Design, implement, test, code, maintain, and restore database; monitor database performance and disk space usage and make changes to database; migrate changes through test environments; provide assistance to users and respond to user questions; coordinate workflow; train users; coordinate physical changes to computer databases; establish physical database perimeters and specifies user database levels and accessibility and perform database fragmentation and recovery. Duties include the use of Oracle, Progress, Shell Scripting, Unix.

Master's degree in Computer Science required. Three years experience in the position or three years as a Software Engineer, Customer Engineer or Field Engineer required. In lieu of a Master's degree will accept a Bachelor's degree plus 5 years of progressive experience. Related Occupation must include experience in designing, implementing, and managing databases and experience using Oracle, Unix, and Shell Scripting.

40 hrs./wk.; 8:00 a.m. - 5:00 p.m.; $70,000 year. Must have proof of legal authority to work permanently in the U.S.

Send resume with social security number to: **Indiana Department of Workforce Development, Indiana Government Center South, 10 North Senate Avenue, Indianapolis, IN 46204-2277, Attention: D.P.G., I.D. # 8095645.** NO CALLS. AN EMPLOYER PAID AD.

Sr. Consultant/Soft. Engineer. Job location: Chicago, IL. Duties: Develop scalable 4-tier architecture leveraging COM + technology. Support multiple backend databases. Provide design decisions pertaining to business & data access COM components & implementation lead. Build extensive prototypes to achieve performance goals. Configure system for various environments. Support different databases & platforms leveraging multi-threaded programming environment utilizing C++ object oriented programming. Requires: M.S. or foreign equiv. in Comp. Sci./Info. Sci., Physics or related field plus 3 yrs exp. in the job offered or 3 yrs exp. as a Soft. Engineer/ Developer. Exp. which may have been obtained concurrently, must include: 1 yr. of exp. utilizing COM and C++. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, IL 60606.

SR. PROGRAMMER ANALYST

Design & implement datawarehousing principles, design & develop processing modules, write hi-speed loader. Enhance/maintain bus. s/ware & comp. prog., write code, prep. test plans. Install s/ware ensuring proper connectivity. Develop queries for data manipulation & interface classes, perform system integration and documentation. Provide tech. support; supervise jr. prgrmr/analysts. Utilize Visual Basic, C/C++, MS-SQL Server, GUIs & Crystal Reports. Must have Master's degree in Comp. Sci., Math or related area. At least 2yr./exp. in similar position. 40 hr/wk. Competitive salary w/ excellent benefits.

Send resume & salary rqrmt'ts to: Blockbuster Inc., Attn: Corporate Recruiter, 1201 Elm St., Dallas, TX 75270 or email it to us careers@blockbuster.com
REF# ISM002N
Blockbuster is an equal opportunity employer.

Sr. Analyst/Programmer. Job location: Columbus, OH. Duties: Analyze, design, develop & implement a variety of IBM Mainframe applications & tools. Consult with clients on the technical & functional requirements of the designed software system. Develop alternative technical proposals. Use Cobol, JCL, DB2, CICS, VSE & DOS on IBM Mainframe platform. Develop the system, including both the Web/Internet software applications & data communications network. Serve as a technical resource to staff & clients in the area of Information Technology on IBM Mainframe area. Requires: M.S. or foreign equiv. in Electronics Eng./ Communications or related field plus 2 yrs exp. in the job offered or 2 yrs exp. as a Web Developer/ Systems Analyst. Exp. which may have been obtained concurrently, must include: 1 yr. exp. using COBOL, JCL, DB2, CICS, VSE & DOS on IBM Mainframe platform. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Drive, Suite 3500, Chicago, IL 60606

Mgr. Job location: Chicago, IL 60607. Job Duties: Provide functional & technical support. Perform report analysis, specifications & development for financials, distribution, base benefits, human resources & payroll. Analyze e-commerce application to ERP using Visual Basic. Implement new business projects. Re-engineer business-to-business & business-to-client supply chain processes. Provide PeopleSoft production functional, technical support & business requirements analysis. Requires: Bachelor's or equiv. in Bus. Admin., Marketing, Finance or related field plus 1 yr. of exp. in job offered or 1 yr. of exp. as a Business/ Systems Analyst, Consultant. Exp., which may have been obtained concurrently, must include: 1 yr. exp. using and programming in PeopleSoft. Employer will accept any combination of education and exp. which is equiv. to a Bachelor's degree in Business Administration. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606.

Full-time Developer in Client-Server application development and programming, relational database design, development and implementation of computer programs using ORACLE, Developer/2000 (Forms 4.5, Reports 2.5), PL/SQL, SQL Plus, SQL Loader, C, OOPS and C++. Must have a minimum of a Master's degree in Computer Science or Information Systems, or a related field. Must have excellent written and verbal communication skills. The candidate must also possess customer service skills. PCS is a smoke-free working environment and offers competitive salary and benefits. Please send resume and cover letter to: Mark R. Federman, PCS, Inc., 1415 N. Dayton, Ste. 3S, Chicago, IL 60622.

Sr. Consultant/Systems Analyst. Job location: Chicago, IL. Duties: Define user's problems and/or needs through gathering data. Write detailed descriptions of user needs, program functions & steps required to develop or modify computer programs. Analyze system capabilities & develop technology solutions. Implement computerized business applications using COOL: 2E system. Upgrade system & correct errors to maintain system after implementation. Requires: B.S. or foreign degree equiv. in Comp. Sci./Info. Sci., Engineering or related field plus 2 yrs. exp. in the job offered or 2 yrs exp. as a Soft. Engineer, Programmer. Exp. which may have been obtained concurrently, must include: 2 yrs of exp. with Cool: 2E system. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606.

Programmer/Analyst. Programs, tests, modifies, and develops various database management systems using Visual Basic and SQL in a client/server networked environment operating under Windows NT, Windows 95, and Windows 98. Uses SQL, Crystal Reports, Crystal Web Reports Server, and Crystal SQL Designer, to develop appropriate reports to insure appropriate data transmission and access, both in an Intranet and Internet environment. Requires Master's degreee in Computer Science. Hours: 8:00 a.m.-5:00 p.m. 40 hours per week at $48,000 per year salary. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 590 Iowa St., Dubuque, IA 52001-4835. Please refer to Job Order IA1101146. Employer paid advertisement.

Sr. Consultant (Programmer/ Analyst). Job location: Irving, TX. Duties: Analyze, design, develop, test, support & maintain comp. soft. for various financial applications using SQL 400 & Query/400 in an AS/400 environment; Analyze, design, develop & implement Business Planning & Control System (BPCS) solutions in accordance with client needs, budgets & time constraints. Requires: B.S. or foreign equiv. in Comp. Sc., Information Systems, Bus. Admin., Acctg. or related field plus 2 yrs exp. in the job offered or 2 yrs exp. as a Financial Applications Analysis & Design Exp. which may have been obtained concurrently, must include: 1 yr exp. using SQL 400 in an AS/400 environment. Send resume to Carmen Strickland, marchFIRST, Inc., 311 S. Wacker Dr., Suite 3500, Chicago, IL 60606.

Software Engineer sought by computer consulting co., in Sugar Land, TX. Must have Bachelor's with major or minor in computer science or computer programming or its equivalent as determined by an accepted credential evaluator, and 3 yrs. exp. Respond to: President, MN/MAA, Noori Technology, Inc., 218 Kentwood Ridge Ct., Sugar Land, TX 77479.

Technology Consultants Inc. (TCI) located in Detroit MI, offers high quality, cost effective software solutions that address a number of IS information needs. We are currently accepting applications for the following positions: Software Engineer, Business Analyst, Programmer Analyst, Project Leader, Database Administrator. If you are a highly motivated individual

please fax your resume to: 248-426-8185

SKW-MBT Management, Inc. seeks experienced applicants for Chief Programmer position in Cleveland, Ohio. BS/MS Comp. Studies, Engg. or other technical field. Skill set to include SAP, Microsoft and Oracle. Send resume to Director, Human Resources, SKW-MBT Management, Inc., 23700 Chagrin Blvd., Cleveland, OH 44122 or lschuld@mbt.com

---

Software Engineer sought by building product company in Diboll, TX. Must have Master's in Comp. Sc., Applied Math or Statistics plus 6 mos. exp in database design and optimization modeling. Respond to: Recruiting, (ZGR), Temple-Inland Forest Products Corporation, 700 N. Temple Dr., Diboll, TX 75941. An Equal Opportunity Employer.

Full-time Principal Engineer responsible for the allocation and assignment of Radio Planning work for Sr. Consultants and RF consultants. Required to schedule the work for all engineers and to assist with the billing for these services. Assist the VP with preparation of contract documents and in the contract negotiation process using experience in the design and operation of digital cellular systems. Carry out design and modeling of the cellular networks, including radio coverage predictions, capacity and demographic analysis, morphological studies and database acquisition, market analysis, specification of features and services, signaling and interface requirements, and testing methodology. Act as liaison between US cellular organizations and the equivalent European organizations. Assist manufacturers and operators in the preparation and submission of license applications and equipment tenders. Conduct prototype testing and field trials of digital cellular systems. Must have a Bachelor's Degree in Communications Engineering or foreign degree equivalent. Must have two years in the job offered or two years in a position with same duties. Salary $87,646/yr. Send resume to: Chip Anderson, Logica 3535 Travis Street, Suite 100, Dallas, TX 75204.

DANIEL/COMPU-DATA, INC. is looking for Software Engineer for its office in San Francisco, CA. Position requires BS or foreign equiv in CS, Eng or related field & 2 yr exp researching, dsgng & dvlpg comp s/ware. Skills sought include: C++ & HTML. Respond to: HR Dept., DANIEL/COMPU-DATA, INC., 22 Third Street, San Francisco, CA 94103. For more job opportunities see www.compudatainc.com

---

We do a better job at helping you get one.

careers.com where the best get better 1-800-762-2977

Business Analysts: Positions available in our New York, New York City, Chicago, San Jose, San Francisco and Nashville area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will apply OO analysis and design methodologies and object modeling techniques to design OO applications. Will be responsible for working with users to define system requirements. Will translate those requirements into clear and precise specifications for the developers to implements. Will design screens, write use cases, design and perform system testing. Requirements: Bachelor's degree in Business, Finance, Computer Information Systems or related field, or foreign equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

Database Administrator. Nashua, NH, manage & administer databases; design, customize, install & configure databases; design logical & physical databases with Oracle Designer 2000; coordinate physical changes to computer databases; tests & correct errors, & refine changes to database; monitor databases for performance tuning; carry out Object-oriented design with UML; review & optimize stored procedures & triggers; implement "real-time" information delivery; use JavaBeans component development, SQL, PL/SQL stored procedures programming; programming with Java Servlets, JSP, HTML, JavaScript, DHTML, ORACLE 8.1.5 & Rational Rose. Qualifs: MS in comp. sci., & Sun Java & Oracle Certification, plus two yrs. exper. in job offrd. 40 hrs/wk, 9am-5pm; $65,000 per yr. Send two copies of res/ltrs of applic. to Job Order # 2001-008, P.O.Box 989, Concord, NH 03302-0989

Database Administrator, Nashua, NH, design, customize, install & configure databases; create table spaces, roles & users; manage & administer databases; design logical & physical databases with Oracle Designer 6.x; coordinate physical changes to computer databases; tests & correct errors, & refine changes to database; monitor databases for performance tuning; carry out Object-oriented design; review & optimize stored procedures & triggers; implement & maintain standby databases; use ORACLE RDBMS, SQL & PL/SQL, Oracle PRO*C, HTML, TCP/IP, Sun Solaris & Sun SPARC. Qualifs: MS in Physics/Comp. Sci., & Oracle Certification, plus two yrs. exper. in job offrd. 40 hrs/wk, 9am-5pm; $67,000 per yr. Send two copies of res/ltrs of applic. to Job Order # 2001-007, P.O.Box 989, Concord, NH 03302-0989.

Applications Developer position with wholesaler/distributor of music, videos and books. Responsible for using advanced procedures and techniques to maintain modify and devise new or existing complex application programs; perform development, customization, testing and maintenance of advanced financial applications using Oracle Financials, Visual Basic and SQL. Must have advanced level expertise as evidenced by Master's Degree plus 1 yr. exp. In offered job duties, or Bachelor's degree plus 5 years progressive experience related to job duties. M-F 9am-5pm; competitive salary. Employer paid ad. Send resume to: Human Resources, ATTN: Catherine Moye, 500 Kirts Blvd., Troy, Michigan 48084.

Sr. Consultant, Lotus Notes Development. Atlanta, GA. Design, develop and implement internet, intranet and extranet solutions as well as intranet enabled decision support systems, web-based transaction facilities and internet and extranet security using C/C++, Java, JavaScript, LotusScript and Lotus Notes Function Language, SQL, HTML and XML. Define software architecture and develop and document software components. Evaluate new technologies. Perform troubleshooting of system applications. Requires: B.S. degree (or foreign equiv.) in Comp. or Info. Sci., Eng. or related field. 2 yrs. exp. in the job offered or as a Software Eng., Developer. Exp., which may have been obtained concurrently, must include 2 yrs. exp. designing, developing and implementing internet, intranet and extranet solutions. 2 yrs. exp. using C++, Lotus Notes and Lotus Script. EOE. 40 hrs/wk. Salary: $75,000/yr. Send resume (no calls) to: Diane Tucci-to, Answerthink Consulting Group, 817 W. Peachtree St., Ste. 900, Atlanta, GA 30308. Must have legal auth. to work in the U.S.

PROGRAMMERS NATIONWIDE

We are looking for individuals with experience in:
• Visual Basic, ASP, COM/DCOM, VC++, Powerbuilder,C++,Unix,SAS
• Oracle, Sybase, Informix, Access (Developers & DBAs)
Oracle Financials & Manufacturing
•JAVA / HTML/ CGI , CORBA,PERL
•NT Admins, Networking Professionals
•Sales / Marketing Executives and Technical Recruiters

All positions require good interpersonal skills. We offer competitive salary & full benefits package. Forward Resume to:

SAVANT
The Power of Knowledge

Savant Consulting Group, INC.
505, Thornall St., Suite 205
Edison, NJ 08837
Tel.: 732-744-0134
Email: recruit@savantinc.com
Visit us at www.savantinc.com

Senior Applications Programmer

International Data Operations, Inc., a provider of software and systems consulting and development services, seeks a Managing Senior Applications Programmer at our Cincinnati, Ohio location. This position involves coordination and supervision of teams in the design, analysis, prototyping, programming and testing of computer software and systems. A qualified applicant should hold a Bachelor's degree in computer science, engineering or related discipline, and 2 - 5 years of experience in Internet and web-based applications programming, Netscape and e-commerce product expertise, including LDAP, NAS, NAB, and CMS preferred. Interested applicants should contact Phyllis Jones, Midwest Sales Manager, 333 Terry Lane, Suite 300, Crescent Springs, KY 41017

Business Analysts: Positions available in our New York, New York City, Chicago, San Jose, San Francisco and Nashville area offices. Will work as team leaders with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will apply OO analysis and design methodologies and object modeling techniques to design OO applications. Will be responsible for working with users to define system requirements. Will translate those requirements into clear and precise specifications for the developers to implements. Will design screens, write use cases, design and perform system testing. Requirements: Master's degree in Business, Computer Information Systems or related field, or Foreign equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

Americas Regional Manager for Geographic Imaging Product Co. Develop marketing strategy & direct distribution & sales operations for N. America (Canada & Mexico), C. America, S. America & Caribbean Basin mkts.; Provide Tech. knowledge of ERDAS products to Co's Int'l Distributor Network; Develop & perform int'l seminars & workshops in Spanish & English lang.; Pursue sales in the Americas & Canada, team with Co's Sales Staff; Research & Analyze competitors' products related to Remote Sensing Industry & provide Int'l Distributors with reqd. competitive tech. knowledge; Keep current on ERDAS products incldg Imagine Suite, Desktop Products & availability of Satellite Images for the Americas & Canada. Req: B.S. in GIS plus 3 yrs exp in job duties or 3 yrs Mktg or Sales Mgmt and/or Engineering or Research exp in GIS industry, including exposure to Object Oriented programming languages. Must be Bilingual Spanish/English. Int'l travel req. 40% of time. Competitive Salary. Submit resume to William R. Pennington, ERDAS, Inc., 2801 Buford Hwy., N.E., Ste. 300, Atlanta, GA 30329.

Sr. Consultant - Commerce Applications. Location of Job: Conshohocken, PA. Duties: Design, develop & implement internet, intranet, & extranet solutions, inc. intranet-enabled decision support sys., web-based transaction facilities & internet & extranet security using Javascript & HTML code generation for Windows or UNIX platform. Design, develop, customized & implement software prog. using C++ and Java. Design databases & web-based applic. using Oracle and/or MS SQL Server. Perform troubleshooting of sys. & applications. Mentor junior consultants. Requires Master's (or foreign equiv.) in Comp. Sci., Bus. Adm., Inf. Sys. Or Related Field., & 3 yrs. exp. in Job Offered or 3 yrs. exp. as Prog/Analyst. Analyst, Software Developer. Exp., which may have been obtained concurrently, must include 2 yrs. exp. designing, developing & implementing internet, intranet & extranet solutions; 2 yrs. exp. using Java and C++. EOE. 40 Hr./Wk., 8:00 a.m. to 5:00 p.m. Salary: $95,000/yr. Send resume (no calls) to Diane Tuccito, Answer-Think Consulting Group, 817 W. Peachtree St., Suite 800, Atlanta, GA 30308. Must have a legal auth. to work in U.S.

Applications/System Architects: Positions available in our New York, New York City, Chicago, San Jose, San Francisco and Nashville area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will design, develop and implement enterprise wide, distributed applications in various OO, client/server, n-tier environments against various relational databases. Will utilize OO languages, including Forte and Java and relational databases such as Informix, Oracle, Sybase, MS SQL Server, and DB2. Will lead development teams. Requirements: Master of Science degree in Computer Science, Computer Engineering or Electrical Engineering, or related field, or foreign equivalent. Bachelor's degree in Computer Science, Computer Engineering or Electrical Engineering or related field or foreign equivalent, plus five years of experience, which must include experience in programming with an object-oriented programming language; If interested, please email your resume and cover letter to jobs@thoughtworks.com.

IT careers.com

Internet Programmer: Provide geographic modeling to responses to web-site marketing utilizing Geographic Information Systems ("GIS") software; database design and system development; maintain national product administration system; maintain web site used to market company services utilizing TCP/IP and HTML; plan, develop, test, maintain and modify computer software utilizing Visual Basic; analyze user requirements.

Master's degree in Geography or Computer Science required. One-year experience in the position or one year of experience as a Consultant required. Related occupation must include experience utilizing GIS software, TCP/IP and HTML; developing, testing, and maintaining computer software using Visual Basic.

40 hrs. /wk; 8:00 a.m. - 5:00 p.m., $ 61,921.60/year. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605. Reference # V-IL 24360-P NO CALLS. AN EMPLOYER PAID AD.

R S Software is a leading, globally positioned company with software development facilities in the US and India. R S Software has ongoing opportunities across the USA for experienced software professionals.
SOFTWARE PROFESSIONALS:
JAVA, JAV Scripts, JAVA Servlet, ASP, CORBA, HTML, DBA: Oracle, SQL Server, DB2 ,VC++ , /C++ , MFC, COM/DCOM, OOD, MS SNA Server
Unix, C/C++, OOA, OOD ,COBOL, CICS, DB2
Systems Administrators: Unix, Solaris, AIX, Windows NT ,Security and Firewalls Administrators
Oracle 8i, Developer 2000/ Designer 2000, C/Pro*C, Unix/Windows NT
MS SQL Server, Visual Basic 6.0, Visual InterDev
IEF/COOLGEN
TPF
Peoplesoft: HR & Payroll modules
Also need:
HUMAN RESOURCES
Executive-Personnel Manager
Generalist/Recruiter
TECHNICAL SALES SUPPORT MANAGER
For a challenge, and competitive compensation.
Please FAX CV to: 408-382-0083
Attn: RST 101
RS Software (India) Ltd.
1900 McCarthy Blvd. # 103
Milpitas, CA 95035

SYSTEMS ANALYSTS
-CORRUGATED DIVISION-

Utilize RPG/400, CL/400 and SQL/400 on an AS/400 platform to maintain existing information system programs and resolve any issues raised by user community; design, code, test and implement enhancements to existing information systems; design, code, test and implement new applications (primarily focused on warehouse management applications) to support corrugated business needs; analyze, review and rewrite programs to increase operating efficiency.

Requirements: Bachelor's degree or equivalent in Computer Science or Information Systems and either two years of experience in job offered or two years of experience as Application Programmer/Analyst. Two years of experience must include design and development of warehouse management related application programs using RPG/400, CL/400 and SQL/400 on an AS/400 platform. 40 hrs/wk, M-F, 9:00 am - 6:00 pm Salary: $61,000 per year.

Send two resumes to:
Gwinnett
Job Order # GA 6924585
1535 Atkinson Rd.
Lawrenceville, GA 33043-5601
(or the nearest Department of Labor Field Service Office.)

Equal Opportunity Employer

A 30 year record of quality people like you.

We know you're in demand. So demand the best environment for your growth: IT consulting with an international leader. We're everywhere business and industry are, with offices all over the country. So you've always got a new set of challenges, with total support. We're currently recruiting the following professionals: Programmers; Programmer/Analysts; Application Development Specialists; Database Analysts; Business Analysts; Technical Support Specialists; Operations Specialists; Network Administrator/Specialists; Software Engineers; and Lead Analyst/Programmers.

Find out more about the rewards of working with Ajilon. To apply for positions in any of our district offices, please visit our website at www.ajilon.com. If you're interested in relocation opportunities, don't hesitate to call 1-800-797-2342 or forward your resume to: Ajilon, Dept. CW1, 550 American Ave., Suite 301, King of Prussia, PA, 19406; Fax: 1-800-798-2342; E-mail natldept@nrec.ajilon.com. An Equal Opportunity Employer.

AJILON
www.ajilon.com

INDUSTRIAL ENGINEER

Plan utilization of equipment, materials and/or personnel to improve efficiency of operations of travel and transportation industry. Analyze work force utilization, operational data and/or programs, recommend, design and manage plans and methods to implement same. Utilize industrial engineering principles such as workflow analysis, and conduct statistical analysis for forecasting and planning purposes. Confer with engineers to resolve problems and determine computer feasibility identifying and prioritizing order of potential solutions. Utilize knowledge of capabilities and limits of computers and engineering, mathematics and computer technology, including process flow analysis, statistical analysis, database management, Windows, DOS and Microsoft Word. Requires a Bachelor's degree in Computer Science, Engineering, Mgmt. Information Systems (MIS), Statistics or Mathematics or foreign degree equivalent as determined by professional credentials evaluation and one year experience in job offered or one year experience in industrial engineering, including operations planning, design and management. University level project experience may be substituted for experience in job offered or experience in related occupation. 40 hour work week, $65,913 per year. Send resume to Workforce Program/A.L.C. Unit, P.O. Box 10869, J.O. #FL-2126481, Tallahassee, Florida 32302-0869.

Applications Developers: Positions available in our New York, Chicago, San Jose, San Francisco and Nashville area offices. Will work with exceptional teams of computer and business professionals participating in full life-cycle development of distributed, object-oriented applications. Will design, develop and implement enterprise wide, distributed applications in various OO, client/server, n-tier environments against various relational databases. Will utilize OO languages, including Forte and Java and relational databases such as Informix, Oracle, Sybase, MS SQL Server, and DB2. Requirements: Bachelor's degree in Computer Science, Computer Engineering or Electrical Engineering or related field, or foreign equivalent. If interested, please email your resume and cover letter to jobs@thoughtworks.com.

where innovation works

Proxicom is a leading provider of Internet consulting, development and integration services. We have positions throughout the US, including Reston, VA; Chicago, IL; Houston, TX; Los Angeles, Sacramento, San Francisco and Sausalito, CA; and New York, NY.

We are recruiting for all types of professionals, including Systems Analysts, Software Engineers, Solutions Developers, Associate/Lead/Management and Senior Consultants, Project Managers, Internet Strategists, Marketing Managers/Consultants, Managing Directors, Technical Writers, Art Directors and Designers/Sr. Designers.

We offer competitive salaries and benefits. To apply, send your resume, specifying position of interest and location, to: Proxicom, ATTN: Recruiting Department, 11600 Sunrise Valley Dr., Reston, VA 20191. Proxicom is an equal opportunity employer.

PROXICOM

Computer Systems Analyst

Duties:
Responsible for Systems Requirement Analysis, Software Architecture and Design, Software Implementation, Software Test and Integration, and Software Documentation for a large scale, multi-user audio digital multipoint control unit. The software designed and developed includes an implementation of complete remote management tools for the product to enable customers to manage and administer from remote locations. This includes the development of a highly specialized FTP (File Transfer Protocol) Server. Also responsible for the design and implementation of a simulator which enables the design and implementation of system features without requiring the use of a standard dedicated hardware platform. Additional tasks include continued development of highly specialized software for both internal development and customer driven contracted or committed developments.

Requirements: M.S. in Computer Science, plus three (3) years of software design experience.

Salary: $52,520.00 **Location:** Austin, Texas **Hours:** 40/hrs. wk

Resumes to: MTK-7
P.O. Box 20009
Pittsburgh, PA 15230-2009

Computer

BioReliance Corporation a leading contract research organization engaged in advanced the devpmt & delivery of healthcare products, seeks a professional possessing the following skills:
- Manage the design, implementation & documentation of new S/W devpmt projects, & enhancements/changes to existing systems (including reports, forms, custom interfaces/integration, stored procedures, & data conversions, etc.).
- Manage other developers & consultants, project time lines, costs, budget and tasks.
- Manage & control SDLC procedures, documentation, & change of control strategies w/particular emphasis on regulated (validated) systems.
- Manage & implement reporting tools/views, deployment to users & security issues.
- Work w/Oracle, UNIX, Windows NT, PL/SQL, Developer 2000.
- Requirements: MS/BS in Com Sci, Engg, Math or Tech. plus 1-5 years exp.

BioReliance pays competitive salary, w/excellent benefits pkg, incl. medical, dental, vision, & 401(K). For immediate consideration send resume for JOB #2000 to: HR Mgr. BioReliance Corporation, 14920 Broschart Rd., Rockville, 20850 Fax: 301-738-1036 Phone: 301-738-1000. Pls visit our website at www.bioreliance.com. EOE m/f/d/v

IT firm looking for individuals with the following skills to fill positions from coast to coast.

Java, Web Dev, Java Script, ORACLE, VB, C, C++
SAP Curriculum Dev./Training
Tech. Proposal Generation,
Delano Dev.

Systems Analyst/ Programmer/ Analyst/IT Training Coordinator
Please send resume to:
Interactive Business Systems Inc.
2625 Butterfield Road, Suite # 114W
Oakbrook, IL 60523
Attn: Michelle Beaumont

Renaissance offers a wide variety of positions for qualified software professionals. We offer both full-time salaried and hourly consulting positions, pre-tax medical insurance, paid vacation, 401(k) flexible spending accounts (FSA) and Employee Stock Purchase Plan (ESPP). Some positions may require higher levels of education and/or additional years of experience. For career opportunities in your area of expertise and specific Renaissance Worldwide office contact information, call our corporate Recruiting Center at: 1-800-248-9119; or visit our Web site at: www.rens.com. EOE.

CW001113CW.7

Innovation

A spirit of creativity and productivity, not only in the application of advanced technology, but also in the innovative solutions we bring to all areas of our business.

Saudi Aramco offers world-class challenges and opportunities to individuals possessing world-class expertise. To find out more about employment opportunities visit:

www.jobsataramco.com

Please reference code IMG.CW

ارامكو السعودية
Saudi Aramco

Systems Engineer who will be responsible for installing, integrating, system testing associated subsystems of two-way paging infrastructure including Wireless Message Gateway, Radio Frequency Controllers (RF-C), base stations, two-way alphanumeric pagers and voice pagers; installing and integrating two-way paging products and two-way paging protocols; designing networks of Wireless messaging systems; installing and testing Network Management System Choreographer; working on automation of regression testing of Wireless Messaging System using C/C++, AWK, SED, PERL, EXPECT; developing client/server applications for automation of testing Wireless Messaging System - Data/Voice using TCP/IP and object oriented technology; using TCP/IP, UDP, FTP, Sliding Window Protocol and communication protocols in testing and trouble shooting; performing customer beta releases and system releases of Wireless Messaging System-Data/Voice; installing and administering UNIX systems; developing quality processes for Beta trails and system releases; implementing software simulators for paging subsystems in C/C++; developing shell test scripts for paging systems to be tested in an automated environment. Must have a Master of Science in Mathematics or Computer Science. One year experience required a Systems Engineer or one year experience as Programmer/Analyst or Software Engineer or any combination thereof. Experience to include: i) installing, integrating and testing two-way paging products and two-way paging protocols, (ii) working on regression tests with automation tools; using at least 2 of the following: C/C++, AWK, SED, PERL, EXPECT; (iii) working with TCP/IP, UDP, FTP or Sliding Window Communication protocols. 40 hours per week, 8:00 a.m. to 5:00 p.m., $69,200 per year. Apply at the Texas Workforce Commission, Austin, Texas or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701. JO#TX1104835. Ad paid by an Equal Opportunity Employer.

Consultants

Software AG Inc. is one of the largest systems software companies worldwide. We are a premier provider of integration technology. We also specialize in the recruitment and placement of consulting software development staff. We need consultants (Programmer Analysts to Systems Analysts) with the following skills:

- **Natural/Adabas**
- **Java**
- **Oracle**
- **OOD/OOP**
- **C++**
- **XML**
- **DBA's (Adabas or Oracle)**

Interested? FAX or e-mail your resume to: Software AG Inc. 1990 N. California Blvd. Suite 950. Walnut Creek. CA 94596. FAX 925/472-4904. E-mail: Nico.Taljaard@softwareag.com.

SOFTWARE AG
ACCEPT NO LIMITS

HP Unix Support Analyst Supervisor (multiple openings) Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using HP Unix. Work requires extensive travel and frequent relocation. Must have one year of experience in the job offered or as a computer professional as well as one year of experience using HP Unix as follows: 1 of A and 1 of B; or 2 of A; or 2 of B. A) RS/6000(S-70, R-50, F50, J40, R40, R20, 99K, 520H, 340H, 320H, 43P140/240, C-10), Sun Sparc, Sun Ultra, SUN Enterprise(220R, 250R, E3000, E3500, E4000, E5000, E7000, E10000), HP 9000(K-Series, D_Series); B) Logical Volume Manager, IBM RAID, SSA, TCP/IP, SUN CLUSTER, HIGH Availability, SUN RAID, Veritas Volume Manager, NIS, NIS+, NFS, MC Service Guard, HP Overview. A Master's degree in one of several limited fields: computer science/applications, engineering, chemistry, mathematics, physics or a scientific or business related field. Will accept Bachelors degree with five years of progressive experience as a computer professional. Salary is $85,000.00 per year, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to Mr. Thomas C. Dembosky, Manager, Indiana Job Center, 350 North Fourth Street, Indiana, PA. 15701-2000. Reference Job Order No.: WEB 135207

Software Engineers and Other Information Technology Professionals

Employee-owned Science Applications International Corporation (SAIC), a Fortune 500 company, provides high-technology services and products to government and commercial customers. **SAIC** and its subsidiaries have estimated annual revenues of over $5.5 billion and more than 41,000 employees at offices in over 150 cities worldwide. Currently, we have multiple openings at various U.S. locations for SOFTWARE ENGINEERS AND OTHER INFORMATION TECHNOLOGY PROFESSIONALS.

SAIC offers a competitive salary and comprehensive benefits package. Qualified applicants please forward your resume and salary requirements to: **SAIC, Human Resources, REF: PT, 1450 Poydras Street, Suite 670, New Orleans, LA 70112; Fax: (800) 650-3562.** We are an Affirmative Action Employer who values cultural diversity in the workplace.

SAIC
Science Applications International Corporation

More information about SAIC is available on the Internet at:
www.saic.com

IT careers.com
where the best get better
1-800-762-2977

TPF Applications Programmer required. Design, code and implement enhancements to a multi-host CRS system using expertise with S/390 systems programming, real-time TPF system internals and TPF systems maintenance.

Experience must include 4+ years with TPF & MV Assembler coding, TPFDF, ISO-C, SPM. Must have proof of legal authority to work in the U.S.

Salary - $50k/year for a forty-hour week.

Send resume only to Colorado Department of Labor & Employment, Employment programs ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number CO4681711.

Pr Analyst (Oakbrook, IL) Plan, develop, test, bus applic programs; evaluate user requests; analyze, develop specifications/programs; review, alter programs; monitor performance; perform conversion. 40 hrs/wk, 9a-5p, $67,500/yr BS in Comp Sci or Math or Phys or Elect Eng & 2 yrs exp req'd. Exp must incl IBM MAINFRAME, COBOL, CICS, DB2, MVS, Novell Netware. Applicants must show proof of legal authority to work in US. Send res to: IL Dept of Empl Security, 401 S State St, 7 North, Chicago, IL 60605 Att:n: B. Grunnet, Ref # VIL 24348-P. An Employer Paid Ad. No caills. Send 2 copies of both res & cover ltr.

Two positions open for Software Engineers to design, develop and implement client/server projects on n-tier architecture using OOAD model with COM and Microsoft Transaction Server (MTS). Should have strong skills in writing Stored Procedures and designing tables in Informix/SQL Server or Oracle as well as excellent SQL Query optimizing techniques. Proficiency in Visual Basic, VB Script, Java Script, ADO and sound knowledge in developing Web based applications required. Knowledge of Teradata SQL using TopEnd is also preffered. Exposure to PDX 3.5 pharmacy systems with a good business knowledge would be a plus.

Salary around 65K DOE. Send resume to Bell USA Inc. 3235 Satellite Blvd. Bldg 400 Suite 300, Duluth GA 30096.

Engineers/Programmers/ Consultants needed. Several senior and entry level positions available for qualified candidates possessing MS/BS or equivalent and relevant work experience. Work with some of the following: Oracle, Cobol, Javascript, Java, Unix, Perl, C++, e-mail resume to Global Consulting, Inc. HR Dept.: gciamerca@yahoo.com

---

BANKING/TECHNICAL CONSULTANTS:
Hatcher Associates Inc. of Los Angeles, CA, an international IT Consulting company, has entry level and experienced openings for the following positions:
- Business Analysts
- Programmers

Please send resume to: jbahar@hatcherassociates.com
Website:
www.hatcherassociates.com

SR. NETWORK ENG Support communication network technology service segment. Bachelor's Computer Sci, Eng or equiv + 2 yrs exp in Info Technology. Exp w/ LAN/WAN design & internetworking, Novelle Netware, MS Win NT & Cisco Routers, remote access & WAN connectivity & data (T1, ISDN, frame relay & ATM). Internet communications & access, host & client/server environments reqd. $70k/yr. Send resume to: EDI, Ltd. 150 Interstate N. Pkwy #200, Atlanta, GA 30067.

ITBC, Inc. seeks Programmer/ Analysts available to relocate to various unanticipated worksites across the United States.

Send résumé's to Fritz Smith at fritz@itbcusa.com, or mail to:

ITBC, Inc.
17752 Preston Road, Suite 202
Dallas, TX 75252

Saber Consulting, software consultants, seeks Sr & Assoc Consultants for various US locations. Bachelor + prof. exp. incl. Oracle. Resume to K.Khanna, 698 12th St. Suite 146, Salem, OR 97301.

Senior Database Administrator Manage, direct and control the activities related to the support and maintenance of Oxford's databases. Forward resume to Amy Johnson, Director, Human Resources, Oxford Global Resources, Inc., 4 Centennial Drive, Peabody, MA 01961. EOE

It's Fast.

It's Huge.

It Crosses Worlds & Dimensions.

IT CAREERS

You can find a *better* JOB with *one* hand tied behind your back.

Just point your mouse to the world's best IT careers site.

Brought to you by Computerworld, InfoWorld and Network World.

Find out more. Call your ITcareers Sales Representative or Janis Crowley, 1-800-762-2977

IT careers.com

Where the best get better

AD INDEX

SALES OFFICES

Computerworld Headquarters:
500 Old Connecticut Path, PO Box 9171, Framingham, MA 01701-9171
Phone: (508) 879-0700, Fax: (508) 875-4394

President/CEO/Publisher
Joseph L. Levy

Senior Vice President/Associate Publisher
Sherry Driscoll-Coleman

Vice President/Customer Solutions
Elaine R. Offenbach

Vice President/Key Accounts
Linda Holbrook

NORTHEAST
ACCOUNT DIRECTORS: Laurie Mannone, Paul Reiss; **SALES OPERATIONS MANAGER:** Leslie Murray; **SALES ASSOCIATES:** Deborah Crimmings, Samantha Monette, 500 Old Connecticut Path, Framingham, MA 01701 (508) 879-0700 Fax: (508) 270-3882

SOUTHEAST
ACCOUNT DIRECTOR: Lisa Ladle-Wallace, 5242 River Park Villas Dr., St. Augustine, FL 32092, (800) 779-5622 Fax: (800) 779-8622; **SALES ASSOCIATE:** Peter Coen, 500 Old Connecticut Path, Framingham, MA 01701 (508) 879-0700 Fax: (508) 270-3882

METRO NEW YORK
ACCOUNT DIRECTORS: Fred LoSapio, John Bosso; **FIELD MARKETING EXECUTIVE:** Maureen Grady; **SALES & OFFICE ASSOCIATE:** Susan Kusnic; **SENIOR SALES ASSOCIATE:** Jean Dellarobba; **SALES ASSOCIATE:** John Radzmiak, Mack - Cali IV, 61 South Paramus Rd. 3rd Floor, Paramus, NJ 07652 (201) 587-0090 Fax: (201) 587-9255, (201) 587-1289

NORTHWEST
ACCOUNT DIRECTORS: John Canevari, Kevin Ebmeyer; **SALES OPERATIONS MANAGER:** Emmie Hung; **SALES ASSOCIATES:** Camilla Dissing, Chris Kallin, 177 Bovet Road, Suite 400, San Mateo, CA 94402 (650) 357-0200 Fax: (650) 524-7000 **FIELD MARKETING EXECUTIVE:** Jill Colley, 10900 N.E. 8th Street, Suite 820, Bellevue, WA 98004 (425) 451-0211 Fax: (425) 451-3822

CENTRAL STATES
REGIONAL VICE PRESIDENT: Blayne Long; **ACCOUNT DIRECTOR:** Tom Buckley; **FIELD MARKETING EXECUTIVE:** Janet Anderson; **SALES ASSOCIATE:** Cathy Vox, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (847) 827-4433, Fax: (847) 827-0690

BAY AREA
ACCOUNT DIRECTORS: Debbie Sorich, Kelly Mahoney, Michelle Yates; **SALES ASSOCIATES:** Amitat Ermias, Rana Farhat, 177 Bovet Road, Suite 400, San Mateo, CA 94402 (650) 357-0200 Fax: (650) 524-7000

SOUTHERN CALIFORNIA
FIELD MARKETING EXECUTIVE: Navid Davani; **SALES ASSOCIATE:** Jill Stevens; 18831 Von Karman Avenue, Suite 200 Irvine, CA 92612 (949) 250-3942 Fax: (949) 476-8724

ADVERTISING OPERATIONS
PRINT DISPLAY ADVERTISING: Toula Karayan, (508) 620-7747 Fax: (508) 879-0446
ONLINE ADVERTISING: Maureen Roberti (508) 271-8007 Fax: (508) 875-6310

COMPUTERWORLD
PRODUCTION: Production Manager/Beverly Wolff **DISTRIBUTION:** Distribution Manager/ Bob Wescott **AUDIENCE AND MARKET RESEARCH:** Director/Joanne Otern; Research Analysts/Seanna Maguire, Candace O'Keefe
ENTERPRISE BUSINESS SOLUTIONS
BOSTON: Director Strategic Initiatives/Leo Leger; Sales Operations Manager/Maria McGrath; Event Operations Manager/Faith Pasternak; Event Program Manager/Michael Meleedy; Conference Manager/Ann-Marie Trebendis; Senior Graphics Production Coordinator/Heidi Broadley; Editor/Stefanie McCann, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 Fax: (508) 875-6310
ONLINE ADVERTISING
Sales Manager/Gregg Pinsky (508) 271-8013; Account Executive/Matt Duffy (508) 820-8145; Sales Operations Manager/Maureen Roberti (508) 271-8007, 500 Old Connecticut Path, Box 9171, Framingham, MA 01701-9171 Fax: (508) 875-6310

IT CAREERS ADVERTISING SALES OFFICES
Vice President-General Manager/Janis Crowley; Marketing Director/Kelli Flanagan; Marketing Specialist/Heidi Tanakatsubo; Sales Marketing Specialist/Chantelle Finney; Operations Manager/Donna Kent; Advertising Coordinators/Leilani Lopez, Carla Amaral, 155 Bovet Road, Suite 101, San Mateo, CA 94402 (800) 762-2977, Fax (650) 286-2770 **EAST:** Regional Manager/ Deanne Holzer, (212) 828-6691; Senior Account Manager/Nancy Mack, 500 Old Connecticut Path, Framingham, MA 01701-9171 (888) 568-5056 Fax (650) 286-2770 **MIDWEST:** Regional Manager/Laura Wilkinson, (773) 248-4301; Account Manager/Donna Dugo, (312) 587-1390; Sales Associate/Rochelle Caravaca (650) 312-0542, 155 Bovet Road, Suite 101, San Mateo, CA 94402, (800) 762-2977, Fax (650) 286-2770 **WEST:** Regional Manager/ Andrea Denny; Account Manager/Whitney Nagy, 155 Bovet Road, Suite 101, San Mateo, CA 94402, (800) 762-2977, Fax (650) 286-2770

LIST RENTAL- POSTAL: Rich Green, (508) 370-0832, e-mail: rich_green@idg.com. **LIST RENTAL- E-MAIL:** Christine Cahill, (508) 370-0808, e-mail: christine_cahill@idg.com. **MAILING ADDRESS:** IDG List Services, P.O. Box 9151, Framingham, MA 01701-9151, FAX: (508) 370-0020

COMPUTERWORLD

President/CEO/Publisher
Joseph L. Levy

Chief of Staff
Laureen Austermann
(508) 820-8522

Vice President/CIO
Rick Broughton
(508) 620-7700

Vice President/Marketing
Derek Hulitzky
(508) 620-7705

Vice President/Editor in Chief
Maryfran Johnson
(508) 620-7724

Vice President/ Manufacturing Operations
Carolyn Medeiros
(508) 620-7733

Vice President/General Manager Enterprise Business Solutions
Ronald L. Milton
(508) 820-8661

Vice President/ Strategic Circulation Operations
Eric Schmierer
(508) 820-8217

Executive Vice President
Matthew C. Smith
(508) 820-8102

INTERNATIONAL DATA GROUP

CHAIRMAN OF THE BOARD, *Patrick J. McGovern* **PRESIDENT/CEO,** *Kelly Conlin*

IDG

Computerworld is a publication of International Data Group, which informs more people world wide about information technology than any other company in the world. With annual revenues of $2.35 billion, IDG is the leading global provider of IT media, research, conferences and expositions. IDG publishes more than 290 computer newspapers and magazines and 700 book titles in 75 countries, led by Computerworld/Infoworld, Macworld, Network World, PC World, Channel World, and the "...For Dummies" global product lines. IDG offers online users the largest network of technology sites around the world through IDG.net (http://www.idg.net), which comprises more than 225 targeted web sites in 55 countries. IDG is also a leading producer of 168 computer-related expositions in 35 countries, and its research arm, International Data Corporation (IDC) provides computer industry research and analysis through 49 offices in 41 countries world wide. Company information is available at http://www.idg.com.

ADVERTISERS INDEX

Advanced Micro Devices 38-39
American Power Conversion 17
ASPECT 51
Authentica 101
Avaya 26-27
BEA 61
BellSouth 37
Bitpipe 112
Brocade 54
Cable & Wireless 45
CapGemini 21
Captus Networks 63
Computer Associates Unicenter . 22-23
Computer Associates E Trust 9
Content Technologies White Paper 32/33
Dell 64/65*
Digex 143
Ecrix 98
Edial 53, 55, 57
Firebrands 41
Foundry Networks 75
Fujitsu America 42-43
Hewlett-Packard 79, 81
HireAbility.com 85
IBM Cross Server 95
ICOM Informatics 123*
Information Builders 109
Intel 2-3
InterSystems Corp. 92
IntraNet Solutions 48
Intrusion.com 71
Legato 117
Liebert 66-67
Maryville Technologies. 113*
Microsoft Press 28
Microstrategy 103
NCR 91
Network Engines 99
Network ICE 64
Nortel Networks 87
Oracle Corp. 144
PACE/BUTLER Corp. 96
Powerware 119
Raging Knowledge 121
RHI Consulting 44
SAGA Software. 69
SAP 97
SAS 15, 24, 106-107
SeattleTimes.com 126*
Security Newsletter 111*
Sitara Networks 89
Skills Village 40
Spectra Logic 125*
Sprint 31
Storage Networks 46-47
SunGard Recovery Services 52
Syncsort. 4
Thingamajob.com 72
3COM. 18-19
Tonic Software 34-35
Unisys 10, 11
Veritas. 114
Verity 58
Verizon 111*
Visual Networks 25
WebSolutionsWorld.com 13
West Coast Computer Exchange 96
Windows 2000 Advantage. 76-77
WorldCom 59
XML Solutions 29
Emerging Companies. 72/73
- Activate.com 25
- ADIC 16
- Attunity. 13
- Corio. 7
- Dell 18-19
- EmTec 35
- ITWorld.com 27
- Iridian Technologies 36
- Tonic Software 8-9
- Veritas C2
- WRQ. 20

***Regional Select Edition**

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

HAVE A PROBLEM WITH YOUR COMPUTERWORLD SUBSCRIPTION?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:
Computerworld, P.O. Box 2043, Marion, Ohio 43305-2043.
Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription
All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

Your New Address Goes Here: **Address shown:** ❑Home ❑Business

NAME
COMPANY
ADDRESS
CITY STATE ZIP

Other Questions and Problems
It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-552-4431**
Outside U.S. call (740) 382-3322. Internet address: circulation@cw.com

NAME TITLE COMPANY ADDRESS CITY STATE ZIP

COMPUTERWORLD allows advertisers and other companies to use its mailing list for selected offers we feel would be of interest to you. We screen these offers carefully. If you do not want to remain on the promotion list please write to the following address - COMPUTERWORLD, Circulation Department, 500 Old Connecticut Path, Framingham, MA 01701.

How to Contact Computerworld

TELEPHONE/FAX

Main phone number ..... (508) 879-0700
All editors unless otherwise noted below
Main fax number ..... (508) 875-8931
24-hour news tip line ..... (508) 820-8555

E-MAIL

Our Web address is **www.computerworld.com.** All staff members can be reached via e-mail using the form: **firstname_lastname@computerworld.com.**

All IDG News Service correspondents can be reached using the form: **firstname_lastname@idg.com.**

LETTERS TO THE EDITOR

Letters to the editor are welcome and should be sent to: **letters@computerworld.com.** *Include your address and telephone number.*

MAIL ADDRESS

PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701

SUBSCRIPTIONS/BACK ISSUES

Subscription rates: U.S., $58/year; Canada, $110/year; Central and South America, $250/year; all others, $295/year

Phone ..... (800) 552-4431
E-mail ..... circulation@computerworld.com
Back Issues ..... (508) 820-8167

REPRINTS/PERMISSIONS

Phone ..... Ray Trynovich (717) 399-1900, ext. 124
E-mail ..... rtry@rmsreprints.com

CONTACTING CW EDITORS

We invite readers to call or write with their comments and ideas. It is best to submit ideas to one of the department editors and the appropriate beat reporter.

Editor in Chief Maryfran Johnson (508) 820-8179
Editorial Director, Print/Online Patricia Keefe (508) 820-8183

DEPARTMENT EDITORS

News Editor Anne McCrory (508) 820-8205
Features Editor Kevin Fogarty (508) 820-8246
Assistant News Editor Don Tennant (508) 620-7714
Assistant Business Editor Melissa Solomon (508) 620-7754
Assistant Technology Editor Tommy Peterson (508) 620-7729
Washington Bureau Chief Mitch Betts (202) 347-6718
West Coast Bureau Chief Pimm Fox (650) 524-7116
West Coast Editor Mark Hall (503) 391-1158

REPORTERS

Mobile computing/wireless Bob Brewin (301) 277-8069
Internetworking, telecom/wireless, defense and aerospace James Cope (219) 273-5369
Application development, Java, automotive Lee Copeland (773) 394-0402
Careers, labor issues, outsourcing, application service providers, health care Julekha Dash (804) 295-9512
General assignment, e-mail, groupware Jennifer DiSabatino (508) 820-8122
Business-to-business e-commerce Julia King (610) 532-7599
Network, systems management, food, retail and restaurant Sami Lais (301) 270-1427
General assignment, travel Michael Meehan (508) 620-7704
Microsoft operating systems and BackOffice, retailers Carol Sliwa (508) 628-4731
Enterprise resource planning, customer relationship management and supply-chain software; Novell Marc L. Songini (508) 820-8182
General assignment, Intel servers, transportation/carriers Linda Rosencrance (508) 628-4734
State/federal government, antitrust, legal issues, politics Patrick Thibodeau (202) 333-2448
IT management, financial services Maria Trombly (413) 323-0842
B2C e-commerce and technologies, databases, data mining, Web infrastructure Dan Verton (703) 321-2277
Large systems/high-end Web server technology, security, heavy manufacturing Jaikumar Vijayan (508) 820-8220
General assignment, Linux and Unix operating systems Todd Weiss (717) 560-5255

OPINIONS

Senior News Columnist Frank Hayes (503) 252-0100
Columns Editor Rick Saia (508) 820-8118

FEATURE EDITORS

Special Projects Editor Ellen Fanning (508) 820-8204
Business Features Editor Thomas Hoffman (845) 988-9630
Reviews Russell Kay (508) 820-8175
Technology Evaluations Editor Robert L. Mitchell (508) 820-8177
IT Management Rick Saia (508) 820-8118
IT Careers David B. Weldon (508) 820-8166

FEATURE WRITERS

Gary H. Anthes (202) 347-0134;
Matt Hamblen (508) 820-8567;
Kathleen Melymuka (508) 628-4931;
Kim S. Nash (773) 275-4133;
Mathew Schwartz (508) 820-8285;
Deborah Radcliff (707) 829-5823

RESEARCH

Mari Keefe, **research manager;**
Lisa Sydney, **online researcher;**
Allison Wright, **research associate;**
Jennifer McBride, **research intern**

COPY DESK

Jamie Eckle, **managing editor/production** (508) 820-8202;
Jean Consilvio, **assistant managing editor/production;**
Michele Lee, Bob Rawson, **senior copy editors;** Jacqueline Day, Eugene Demaitre, Linda Frank, Mike Parent, **copy editors**

GRAPHIC DESIGN

Stephanie Faucher, **design director,** (508) 820-8235;
Mitchell J. Hayes, **art director;** April O'Connor, **associate art director;** Julie D'Errico, Michael Knapp, **graphic designers;** Joy Park, **editorial graphics coordinator;** Rich Tennant, John Klossner, **cartoonists**

ADMINISTRATIVE SUPPORT

Linda Gorgone, **office manager** (ext. 8176);
Connie Brown (ext. 8178); Lorraine Witzell (ext. 8139);
Gussie Wilson (650) 524-7035, **editorial assistants**

COMPUTERWORLD ONLINE

Tom Monahan, **director, online and design** (508) 820-8218;
Sharon Machlis, **managing editor/online** (508) 820-8231;
Craig Stedman, **online news editor** (508) 820-8120;
Marian Prokop, **online news editor** (508) 620-7717; Vanessa DiMauro, **communities director** (508) 820-8110;
Brian Sullivan, **communities page editor** (508) 620-7780;
John R. Brillon, David Waugh, **associate art directors;**
Peter Smith, **Web development manager;**
David Ramel, **online production coordinator and e-mail newsletter editor;** William Rigby, **online services manager**

CONTRIBUTING COLUMNISTS

Allan E. Alter, Joe Auer, Jim Champy, John Gantz, Dan Gillmor, Peter G. W. Keen, Bill Laberis, David Moschella, Fran Quittel, Paul A. Strassmann, Don Tapscott, Ed Yourdon

CONTRIBUTING WRITERS

Leslie Goff, Amy Helen Johnson

COMPANIES IN THIS ISSUE

Page number refers to page on which story begins. Company names can also be searched at
www.computerworld.com

2000IDEAS.COM 8
ABERDEEN GROUP INC. 24,28,94
ACTIVMEDIA RESEARCH LLC 14
ADAPTEC INC. 94
AKAMAI TECHNOLOGIES INC. 50
AMACOM BOOKS 96
AMAZON.COM INC. 56,68,88,96
AMERADA HESS CORP. 108
AMERICA ONLINE INC. 10,24
AMERICAN EXPRESS CO. 62
AMERICAN INTERNATIONAL GROUP INC. 58
AMERICAN MEGATRENDS INC. 94
AMR RESEARCH INC. 8
AMSTERDAM INTERNET EXCHANGE BV 50
ANDERSEN WORLDWIDE 60
APACHE SOFTWARE FOUNDATION 33
API NETWORKS INC. 14
APPLE COMPUTER INC. 60,86
ARIBA INC. 30
ARIZONA DEMOCRATIC PARTY 115
ARTEMIS MANAGEMENT SYSTEMS 98
ARTESIA TECHNOLOGIES INC. 90
ASSOCIATION OF CORPORATE PRIVACY OFFICERS 62
AT&T CORP. 1,24,62,115,120
ATLANTIC MUTUAL COMPANIES 58
AUTOMATIC DATA PROCESSING INC. 20
BANTU INC. 24
BEA SYSTEMS INC. 115
BEDQUIN INC. 30
BEST BUY CO. 12
BLUESTONE SOFTWARE INC. 94
BORLAND INTERNATIONAL CORP. 30
BRISTOL TECHNOLOGY INC. 12
BROADCOM CORP. 56
BROADWAY BOOKS 86
BULFINCH PRESS 90
BURLINGTON COAT FACTORY WAREHOUSE CORP. 108
CABLE NEWS NETWORK INC. 1,115
CALDERA SYSTEMS INC. 16,108
CANON INC. 102
CHASE MANHATTAN CORP. 10
CISCO SYSTEMS INC. 12,30,94,120
CITIGROUP INC. 10
CITRIX SYSTEMS INC. 124
CLARUS CORP. 30
CMGI INC. 14
CMGION INC. 24
CMP MEDIA INC. 86
COMMERCE ONE INC. 30
COMPAQ COMPUTER CORP. 12,14,115
COMPUTER ASSOCIATES INTERNATIONAL INC. 100
COMPUTER SCIENCES CORP. 1
COMPUTER SECURITY INSTITUTE 73,78
CONXION INC. 73
CORNING CABLE SYSTEMS 24
CREDIT SUISSE FIRST BOSTON CORP. 24,56
CROSSCOMMERCE INC. 56
CRYPTO-RIGHTS FOUNDATION 50
CYBERSOURCE CORP. 96
DAIMLERCHRYSLER AG 8
DELL COMPUTER CORP. 12,94
DIGEX INC. 120
DIGITAL CONSULTING INC. 96
DIGITAL CONVERGENCE CORP. 68
DIRECT MARKETING ASSOCIATION 65
DOUBLECLICK INC. 62
DOW CORNING CORP. 80
DRUGSTORE.COM INC. 14
EASTMAN CHEMICAL CO. 6
EASTMAN KODAK CO. 102
EBALANCE INC. 10
ELECTION DATA SERVICES INC. 1
ELECTION.COM INC. 115
EMARKETWORLD INC. 86
EMERY WORLDWIDE 24
EMULEX CORP. 94
ENRON ENERGY SERVICES INC. 73
ENSPOT.COM INC. 56
ENTERPRISE MANAGEMENT ASSOCIATES INC. 94
ENTEX CONSULTING SERVICES 1
EQUANT NV 20
ESCALATE INC. 56
ESSENTIUS INC. 8
EVE.COM INC. 14
EXCALIBUR TECHNOLOGIES CORP. 94
FBI 1,32,50
FEDERAL COMMUNICATIONS COMMISSION 94
FEDERAL ELECTION COMMISSION 1
FEDERAL TRADE COMMISSION 62,68
FEDERATION OF AMERICAN SCIENTISTS 1
FERRIS RESEARCH INC. 24
FIRST CONFERENCES LTD. 86
FIRST UNION CORP. 10
FLASHPOINT TECHNOLOGY INC. 90
FLEETBOSTON FINANCIAL CORP. 10
FOOTE PARTNERS LLC 36
FORRESTER RESEARCH INC. 6,10,14,56
FURNITURE.COM INC. 14
GARTNER GROUP INC. 1,30,73,98
GENERAL ELECTRIC CO. 8,66
GENERAL MOTORS CORP. 12
GENESYS SOFTWARE SYSTEMS INC. 20
GEORGE B.H. MACOMBER CO. 98
GIGA INFORMATION GROUP INC. 16,20,30,62,120
GREDE FOUNDRIES INC. 108
GUARDENT INC. 36
HALE AND DORR LLP 6
HARPERCOLLINS PUBLISHERS 86
HAVENCO LTD. 50
HEALTHCENTRAL.COM 14
HEWLETT-PACKARD CO. 94,98
HOME SHOPPING NETWORK 115
HOMERF WORKING GROUP 12
HORTY & HORTY PA 88
HURWITZ GROUP INC. 12,56
I2 TECHNOLOGIES INC. 30
IBM 1,12,14,16,20,30,94,102,115
ICAST CORP. 24
ICONOMY.COM INC. 56
IDEFENSE INC. 1
ILLUMINATA INC. 94
IMAGINE MEDIA 56
IMPACT PUBLICATIONS 86
INFOSEEK JAPAN 50
INPRISE CORP. 30
INSURANCE REVOLUTION INC. 58
INTEL CORP. 7,12,16,115
INTERMEDIA GROUP INC. 86
INTERNATIONAL COMPUTER NEGOTIATIONS INC. 90
INTERNATIONAL DATA CORP. 12,16,24,28,30,62,108
INTERNATIONAL PAPER CO. 8
INTERNET ENGINEERING TASK FORCE 14,24
INTERNET SECURITY ADVISORS GROUP 73
INTERNET SOCIETY 14
INTERWOVEN INC. 56
IVENDOR INC. 56
IXL ENTERPRISES 16
J.P. MORGAN & CO. 88
JABBER.COM INC. 24
JERBOA INC. 96
JOBJECTS INC. 124
JOBSERVE LTD. 100
JOHN WILEY & SONS INC. 86
JOHNSON & JOHNSON 86
JOSSEY-BASS INC. PUBLISHERS 86
JUNKBUSTERS CORP. 68
JUPITER COMMUNICATIONS INC. 20
KEEN EDUCATION 50
KEYNOTE SYSTEMS INC. 7
KIMO.COM 30
LAVERONE INC. 120
LEICA TECHNOLOGIES INC. 102
LERNOUT & HAUSPIE SPEECH PRODUCTS NV 30
LINUX NETWORX INC. 14
LINUXCARE INC. 108
LINUXPLANET.COM 108
LITTLE, BROWN AND CO. 90
LIZ CLAIBORNE INC. 8
LM ERICSSON TELEPHONE CO. 14
LOTUS DEVELOPMENT CORP. 24,30
LUCASFILM LTD. 56
LUCENT TECHNOLOGIES INC. 1,12,30
LUMINANT WORLDWIDE CORP. 16
MARIST COLLEGE 82,84
MARRIOTT INTERNATIONAL INC. 60
MEDIA METRIX INC. 7
MERCANTEC INC. 12
MERRDEN RESEARCH INC. 10
META GROUP INC. 1,115,120
MICROSOFT CORP. 12, 24,30,32, 94,100,108,115,124
MINDBRIGHT TECHNOLOGIES AB 124
MIT 80,86,98
MOBILE INSIGHTS INC. 12
MORE.COM INC. 14
MORGAN STANLEY DEAN WITTER & CO. 10
MOTHERNATURE.COM INC. 14
MOTOROLA INC. 12
MUTUAL OF OMAHA INSURANCE CO. 62
NASDAQ STOCK MARKET INC. 16
NEC RESEARCH INSTITUTE INC. 104
NEC TECHNOLOGIES INC. 8
NETSCAPE COMMUNICATIONS CORP. 33
NETWORK FLIGHT RECORDER INC. 73
NETWORK ICE INC. 73
NEWIDEATRADE.COM 8
NIKON CORP. 102
NORTEL NETWORKS CORP. 120
NYSERNET INC. 120
OFFICE DEPOT INC. 20
OILLY 8
OLLY'S BV 8
OLYMPUS AMERICA INC. 102
ORACLE CORP. 16,30,62,115,142
OXFORD HEALTH PLANS INC. 1
OXFORD UNIVERSITY PRESS INC. 86
PALM INC. 12
PARA-PROTECT SERVICES INC. 96
PATRICIA SEYBOLD GROUP INC. 30,60
PAYTRUST INC. 10
PEOPLESOFT INC. 60
PERL INSTITUTE 33
PETS.COM INC. 14
PHOS CORP. 80
PINNACLE DECISION SYSTEMS INC. 84
PLANVIEW INC. 98
PREDICTIVE SYSTEMS INC. 73
PRICEWATERHOUSECOOPERS 86
PRIMAVERA SYSTEMS INC. 98
PROCTER & GAMBLE CO. 8
PROJECT MANAGEMENT INSTITUTE 60
QUICK & REILLY INC. 20
R.R. DONNELLEY AND SONS PUBLISHING CORP. 24
RAYMOND JAMES ASSOCIATES INC. 94
REBOUL, MACMURRAY, HEWITT, MAYNARD & KRISTOL 7
RECOURSE TECHNOLOGIES INC. 73
RED HAT INC. 16,108
REGLANG INC. 90
RIVERSOFT TECHNOLOGIES LTD. 94
ROYAL DUTCH/SHELL GROUP 8
RSA DATA SECURITY INC. 104
S.C. JOHNSON & SON INC. 8
S1 CORP. 10
SABA SOFTWARE INC. 33
SALEM FIVE CENTS SAVINGS BANK 10
SAMSUNG ELECTRONICS CO. 14
SANCTUM INC. 1
SANDS BROTHERS & COMPANY LTD. 88
SANS INSTITUTE 86,141
SAP AG 20, 80
SEARS, ROEBUCK AND CO. 88
SENOMAIL INC. 30
SIEMENS AG 8,20
SIERRA CLUB 115
SMARTONE 1
MOBILE COMMUNICATIONS LTD. 30
SONY CORP. 102
SOPHOS INC. 100
SPRINT PCS GROUP 90
ST. PAUL COMPANIES INC. 58
STEPSTONE ASA 100
STEPSTONE CO UK LTD. 100
STRATEGIS GROUP 12
SUCCESS PERFORMANCE SOLUTIONS 84
SUMMIT STRATEGIES INC. 108
SUN MICROSYSTEMS INC. 108,115,142
SURGENCY INC. 12
SUSE AG 16,94
SYBASE INC. 115
SYCHIP INC. 94
SYMANTEC CORP. 100
T@S SUPERSTATION INC. 115
TD WATERHOUSE GROUP INC. 20
TELECHOICE INC. 30
TELEHOUSE INTERNATIONAL CORPORATION OF EUROPE LTD. 50
THE ALLSTATE CO. 90
THE BOEING CO. 24
THE COCA-COLA CO. 8,20
THE CONFERENCE BOARD INC. 86
THE DELPHI GROUP 86
THE EPITEC GROUP 84
THE MEDSTAT GROUP INC. 16
THE PATENT AND LICENSE EXCHANGE INC. 8
THE RAND CORP. 1
THE SANTA CRUZ OPERATION INC. 108
THE WORLD BANK GROUP 94
THE YANKEE GROUP 12
TIBET ONLINE 50
TIDEPOINT CORP. 24
TIME WARNER INC. 115
TIME WARNER TRADE PUBLISHING 90
TOWERGROUP 20
TOYOTA MOTOR CORP. 8
TOYOTA MOTOR SALES USA 24
TOYSMART.COM INC. 68
TRANSITION PARTNERS 90
TRANSMETA CORP. 16
TRANSPARENT LANGUAGE INC. 24
TREND MICRO INC. 100
TRIBAL VOICE 24
TRUSECURE CORP. 7
TURBOLINUX INC. 16,108
TURNER BROADCASTING SYSTEM INC. 115
TURNER NETWORK TELEVISION 115
TYSON FOODS INC. 120
U.S. BANCORP 62
U.S. DEPARTMENT OF ENERGY 28,94
U.S. DEPARTMENT OF JUSTICE 7,32
UNISYS CORP. 115
UNITED NATIONS FEDERAL CREDIT UNION 115
UNIVERSITY OF SOUTHERN CALIFORNIA 86,104
UNIX INTERNATIONAL 8,36,100,115
VA LINUX SYSTEMS INC. 108
VERISIGN INC. 14
VERIZON COMMUNICATIONS 62
VERTICALNET INC. 30
VIANT CORP. 16
VICOR CORP. 16
VIGA U.S.A. INC. 96
VISTASOURCE INC. 124
VITE CORP. 98
VITESSA CORP. 56
VOTEEXCHANGE.COM 6
WARNER BOOKS INC. 90
WEB DE AS 108
WEBB INTERACTIVE SERVICES INC. 24
WELCOM 98
WILSON GROUP COMMUNICATIONS INC. 141
WINSTAR COMMUNICATIONS INC. 50
XEGYPT 1
XPEDIOR INC. 16
XYBERNAUT CORP. 60
YAHOO INC. 1,30,88,96
YET2.COM 8
YODLEE.COM INC. 10

Continued from page 1

Cyberwar

mation campaign. and they have also been successful in keeping major service providers off-line through various denial-of-service techniques.

Just last week, hackers attacked Lucent Technologies Inc. However, a spokesperson for the Murray Hill, N.J.-based company said that no damage was done and that it was "business as usual" for the site.

A spokesman for the FBI confirmed that the attacks "have moved beyond what we've seen in the past in terms of sophistication." In fact, some hackers have been sharing information on specific port vulnerabilities on individual systems, the spokesman said.

Hacker Alert

Pro-Palestinian individuals and groups involved in cyberattacks include:

- ReALiST
- Project Gamma
- Dodi
- Unity
- Xegypt
- Hezbollah
- Ummah.net
- Arab Hax0rs
- al-Muhajiroun (headquarters in London, with chapters in the U.S.)

SOURCE: IDEFENSE INC., FAIRFAX, VA.

Security and intelligence experts warn that pro-Palestinian groups have entered a new phase in the conflict that aims to attack "Zionist" e-commerce sites in the U.S. and Israel, as well as other high-profile sites that could help publicize their cause.

An intelligence report issued by Internet security firm iDefense Inc. in Fairfax, Va., uncovered evidence on hacker message boards that popular U.S. Web sites such as those of Yahoo Inc., CNN and AT&T Corp. might be on the list. Those companies declined to comment.

There are also clear signs that plans may be in the works for a major denial-of-service attack against U.S. sites. A pro-Palestinian group known as Unity has said publicly that if its Web sites are hacked by opponents, it will begin "attacking Zionist e-commerce sites with millions of dollars of losses in transactions."

In another case, a member of the Xegypt hacker group who goes by the name ReALiST posted a message on an Arab hacker bulletin board asking for help to do just that.

"I'm thinking of installing [Tribal Flood Network 3000] servers and doing the CNN.-com and Yahoo.com thing again any one in, mail me quick [sic]," the message stated.

Pro-Palestinian hackers have also deployed a FloodNet-type tool known as "defend," and are currently using it to attack at least seven targets, according to iDefense.

Defend requests nonexistent pages on targeted sites by calling for Web site addresses based on the current date to defeat Web-cache-related security mechanisms, which in the past have prevented hacker penetrations.

Unheeded Warning

The FBI and security vendors have been issuing warnings about such attacks, but most U.S. companies nonetheless remain unprepared for them, experts said.

One recent audit showed that 97% of U.S. firms are vulnerable to the tactics being used by pro-Palestinian hackers, according to Peggy Wiegle, CEO of Sanctum Inc., a Santa Clara, Calif.-based company that has helped defend Israeli government Web sites.

For example, Wiegle said, most sites don't have security software installed that is capable of blocking hackers who break into back-end systems through vulnerable Web browser applications such as shopping carts.

"A badly protected Web site is like a portal into your back-end systems," said Wiegle.

And timing could be an important factor as U.S. retailers enter what they expect could be a $19 billion online holiday-sales season. Any disruption to the holiday season would certainly "make a lot of noise," said Richard Hunter, managing vice president and research director for e-metrics at Stamford, Conn.-based Gartner Group Inc.

"Timing is key, because timing is linked to publicity," Hunter said.

However, while attacks could put a temporary damper on online sales, any large-scale economic impact resulting from such attacks is unlikely, said Steven Aftergood, an intelligence specialist at the Federation of American Scientists in Washington.

Martin Libicki, a defense analyst at the Washington-based policy think tank The RAND Corp., said he agreed and added that the tactics of the pro-Palestinian hackers may actually hurt their cause.

"Palestinian strategy should attempt to separate the United States from Israel," Libicki said. "This clueless tactic cannot help but do the opposite."

How Companies Can Enhance Web Security

BY DAN VERTON

With the peak online holiday buying season just around the corner, Internet security experts are urging U.S. companies to enhance their security posture in light of recent threats made by hacker groups in the Middle East to launch an electronic holy war against companies with ties to Israel.

SECURITY TIPS

"Most companies are spending less than 3% of their budgets on security," said Richard Hunter, managing vice president for e-metrics consulting at Stamford, Conn.-based Gartner Group Inc. "They are getting lucky. Any hacker with a screwdriver can knock them over. The lessons that have been learned so far have not been learned by a critical mass of the potential victims."

And those lessons, according to a recent Gartner study on the Middle East hacker threat, are many. "When a potential threat has been identified, standard enterprise security measures should be complemented by increased firewall analysis, intrusion detection and detailed inspection of site usage logs," said the study.

Internet service providers and server hosting companies also must have the processes in place to quickly detect and react to denial-of-service attacks.

Commonsense steps that companies can take to enhance their security include reviewing corporate relationships, such as banking arrangements, to see if there are any links that might make them potential targets, said John Pescatore, research director for Internet security at Gartner.

In addition, although disconnecting entirely from the Internet isn't a practical option, "you certainly need to be reviewing your intrusion detection logs more frequently, conduct penetration testing against yourself and check your Web servers more frequently to see if they have been manipulated," said Pescatore.

The design of a company's e-commerce network also plays a role in creating an active defense against hackers, said Allan Paller, director of research at the SANS Institute, a security research organization in Bethesda, Md. "Once the attack has been identified, effective network controls can sometimes allow some business to continue instead of just falling over dead," said Paller.

In additon, Paller urges the use of strong encryption to protect customer information. "Reputation destruction comes from loss of important personal data belonging to clients," said Paller. "Encryption of all such information is really important."

Steve Wilson, president of Wilson Group Communications Inc., a Columbus, Ohio-based crisis-management firm, added that companies also must think proactively about the hours and days after an attack has occurred.

For example, when the Love Bug virus brought down several major e-commerce sites last year, "too many companies were not prepared at all for anything like that, and as a result, they just didn't have anything to tell their customers," said Wilson. "You need to tell people something."

And, if necessary, companies need to be prepared to make concessions to customers, such as extending special pricing to make up for people not being able to use their site, Wilson said.

But being honest with your customers goes only so far. Companies must also be willing to share information with the industry at large and with federal law enforcement agencies, said Wilson. Unfortunately, many companies are unwilling to do so because of the fear that the news will put them out of business.

"Companies have an obligation within reason to share that information with other companies so that they can avoid it," said Wilson. "There's too much at risk to the economy for companies to hold this information. If Microsoft can admit it, anybody can."

MOREONLINE

To discuss this story with your peers – and to get easy access to all of our security coverage – go to *Computerworld*'s Security Watch Community at **www.computerworld.com/security**

Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement #0385697. CANADIAN POSTMASTER: Please return undeliverable copy to PO Box 1632, Windsor, ON N9A 7C9. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Copyright 2000 by Computerworld Inc. All rights reserved. Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased from the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress St., Salem, Mass. 01970. Reprints (minimum 100 copies) and permission to reprint may be purchased from Ray Trynovich, Computerworld Reprints, c/o Reprint Management Services, Greenfield Corporate Center, 1811 Olde Homestead Lane, Lancaster, Pa., 17601, (717) 399-1900, ext. 124. Fax: (717) 399-8900. Web site: www.rmsreprints.com. E-mail rtry@rmsreprints.com. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $5 per copy U.S. – $98 per year. Canada – $110 per year. Central & So. America: $250 per year. Europe – $295 per year; all other countries – $295 per year. Subscriptions: call toll free (800) 552-4431. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Box 2044, Marion, Ohio 43305.

ABC ABP BPA

FRANK HAYES/FRANKLY SPEAKING

Ten for the 'ages'

CALL THEM THE TEN COMMANDMENTS for beating IT age bias. We know it's out there for over-40 IT professionals ["Beating IT Age Bias," The Back Page, Oct. 30]. And readers who have faced it say up-to-date skills and a good job history aren't always enough. But there *are* ways to even the odds.

I. Thou shalt think small. Big companies can afford the luxury of a wet-behind-the-ears superspecialist who has mastered the latest point release of Oracle12 or Visual C# but knows nothing else. Smaller companies need flexibility, broad experience and good business sense. They may not pay as much, but they'll let you create value. And your résumé will be read by a human being, not just a computer scanning for keywords.

II. Thou shalt think local. Local companies don't blanket campuses with recruiters the way multinationals do. They don't want to pay relocation expenses. They're at the bottom of the list for the in-demand hotshots. Which means you're not competing with those hotshots — and your experience gives you an edge.

III. Thou shalt think business. If you've been paying attention for the past 20 years, you know how a business really runs. Your young competition doesn't. Business rules, workflow bottlenecks, real-world user needs — this is where you've got an edge. Use it.

IV. Thou shalt leverage your experience. And not just IT experience. If you know accounting or manufacturing or sales support or have any other business-focused expertise, trot it out. Technology knowledge doesn't generate profits — business knowledge does that. And putting technology to work for business is what IT is about.

V. Thou shalt offer what's needed. Companies need people to integrate e-business systems with legacy applications, not to maintain dusty-deck Cobol code. They want someone who will think in terms of customers, not just users. Ask what they need. If you can deliver it — even if it's not on your résumé — you've solved their problem.

VI. Thou shalt get help in your job search. Get interview coaching. Get wardrobe recommendations. Get an expert to polish your résumé. Face it, you're not a job-hunt guru — if you were, you'd already have a job. Get all the help you can — it won't hurt, and it may tip the balance.

VII. Thou shalt call in favors. From friends, family and former co-workers. They're good for introductions, recommendations and inside dope on job prospects. They owe you — and now is the time to collect.

VIII. Thou shalt work the phone. Salespeople have a name for it: "cold calling." You call a company, introduce yourself, ask what they're looking for, find out who to send your résumé to, make small talk. Sure, you'll hate it; *everybody* hates making cold calls. But that's how you turn up job leads that nobody else — including you — knows about.

Get all the help you can — it won't hurt and it may tip the balance.

IX. Thou shalt be energetic, aggressive and positive. When employers look at you, they want experience, practical smarts, even wisdom. But they also want to know you can keep up with the kids. And they want to know you can work with those kids, and even lead them. Get pumped up. Go in strong. Close the deal.

X. Thou shalt consider consulting. It's amazing how many companies that would never think of putting an old fogy like you on the payroll will pay twice as much for you as a hired gun.

And if you're still employed but hearing rumblings that older workers like you are about to get the ax, there's an eleventh commandment:

XI. Thou shalt get a lawyer. A good one who specializes in employment law. It may sound nasty, and it might kill your chances for future promotions at your company. But then, so would landing in the street — wouldn't it?

Hayes, Computerworld's senior news columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

HOT VOTE To shave its IT budget, this county government goes with a Brand X vote-counting machine, says an insider pilot fish. To save more money "and make the eco types happy," the ballots are printed on recycled paper. The weekend before election day brings 14 inches of rain, and now the damp recycled ballots won't feed through the cheap reader. Solution: Staffers grab handheld hair dryers and blow-dry 20,000 ballots.

TAIL OF HORROR Help desk gets a request from a user on the factory floor for a replacement mouse. What happened to the old one? asks the help desk pilot fish. Seems a worker accidentally ran over it with the big riding vacuum cleaner. "All that was left was the frayed tail," reports the fish, "and the cover for the ball shooting across the floor."

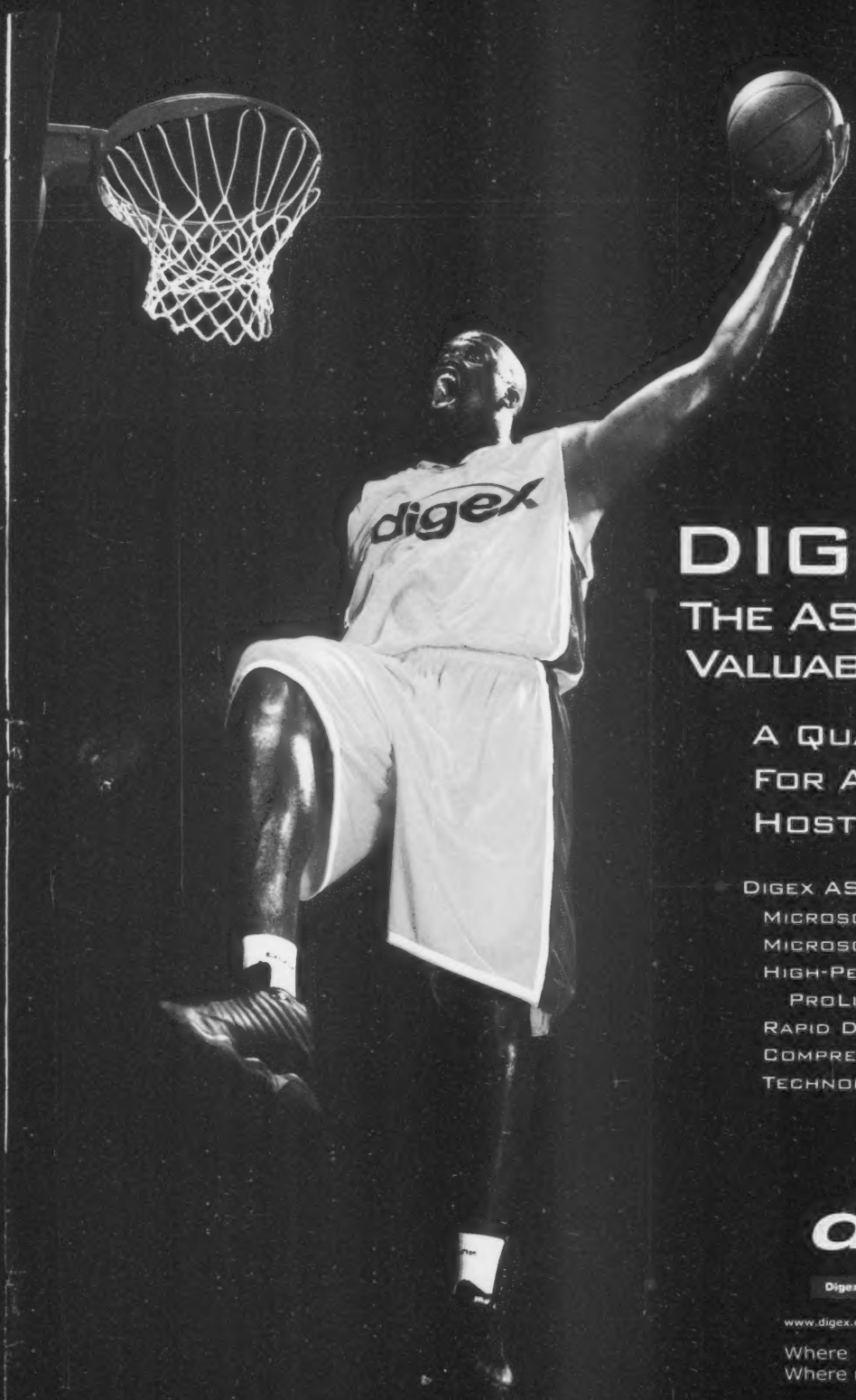
UNDER WARRANTY A Sun SPARC Ultra 5 dies, so IT calls for service and a repair guy promptly arrives. Pilot fish realizes the repair guy doesn't actually work for Sun when he opens the computer, looks inside and asks, "What kind of Pentium is this?"

BAD NOISE Pilot fish on an errand in the computer room notices the UPS indicator is on. "We're running on battery and have maybe five minutes left before it's drained," he says. A little quick investigation shows someone apparently tripped over the UPS power cord and pulled it out of the wall. "Didn't the alarm go off?" fish asks computer-room staffer as he plugs it back in. "Yes, it makes a really annoying noise. I got sick of it," says the staffer. "But if you press this button, it shuts up."

GOOD NOISE Every two months, one billing clerk at an auto parts retailer asks for a new keyboard. Help desk pilot fish gets curious, so he takes an elevator ride to check it out. While he talks with the user, he sees the problem: As the clerk removes staples from batch invoices, she drops them into her keyboard. Seems she didn't want to chance missing the trash can and getting the staples stuck in the carpet. "Plus," she adds, "the staples sounded nice inside the keyboard."

Sharky likes the kind of true IT tales you send to **sharky@computerworld.com**. You get a Shark T-shirt if your story sees print – or if it shows up in the daily feed on the Web at *computerworld.com/sharky.*

The 5th Wave



DIGEX

THE ASP'S MOST VALUABLE PARTNER

A QUANTUM LEAP FOR APPLICATIONS HOSTING

DIGEX ASPWORKS FOR WINDOWS™
- MICROSOFT WINDOWS 2000
- MICROSOFT APPLICATIONS SUITE
- HIGH-PERFORMANCE COMPAQ PROLIANT™ SERVERS
- RAPID DEPLOYMENT
- COMPREHENSIVE MONITORING
- TECHNOLOGY BETA PROGRAMS

digex

Digex | keeps e-business in business™

www.digex.com/application 1-800-455-2968 Ext. 305

Where managed hosting began.
Where managed hosting is going.

COMPAQ Microsoft

©2000 Digex, Inc. All trademarks, tradenames and service marks mentioned or used belong to their respective owners. All rights reserved.

Triple Performance
with Oracle 9*i*
Application Server.

Our high-speed cache,
coupled with our database,
will run your web site
three times faster than
IBM or Microsoft
or we will give you
$1,000,000 in cash.

ORACLE®
SOFTWARE POWERS THE INTERNET™

For important details, conditions and limitations visit www.oracle.com/guarantee

Copyright © 2000 Oracle Corporation. All rights reserved. Oracle is a registered trademark, and Software Powers the Internet is a trademark or registered trademark of Oracle Corporation. Other names may be trademarks of their respective owners.